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PLANS --
Timber Management - ~~Lassen~~
Eastern Lassen Working Circle

FRC 48481

Susanville, California
May 17, 1937

REVISED

MANAGEMENT PLAN FOR EASTERN LASSEN WORKING CIRCLE

LASSEN NATIONAL FOREST

CALIFORNIA

Marc W. Edmonds,
Associate Forester

Fred Bacon,
Technician

TRANSFERRED

**TIMBER MANAGEMENT
FILE COPY**

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Respectfully submitted

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FOUNDATION

1. INTRODUCTION

The plan of 1922 was formulated by A. E. Wieslander in 1921 and completed March 1, 1922.

The plan divided the Working Circle into Blocks A, B, C, and D.

Block A, including roughly the three northern tiers of townships, (see Diagram of Units) in area about 170,000 acres of Government land, was set aside as the Fruit Growers' Supply Company operating zone. This company invested in approximately one billion feet of private timber and is organized on a sustained yield basis to insure the citrus growers with a steady supply of box shoo and lumber.

Block C, including parts of eight townships on the southern edge of the Working Circle, in area about 51,000 acres of Government land, was set aside as the Lassen Lumber and Box Company operating zone.

Blocks B and D included private timber holdings east of the main forest boundary - B roughly T. 30 and 31 N., R. 10E., about 40,000 acres, and Block D the balance of about 50,000 acres. This division was merely for convenience in defining priority of acquisition and protection policies.

The initial plan contemplated a rotation of 120 years and for Block A, a first regulatory cutting cycle of 70 years. A heavy cut was planned for the first 20 years depreciation period for two plants, in Blocks A and C, at the end of which the remaining timber was to be budgeted to supply a small cut to one plant for the balance of the cutting cycle.

Block A was placed under regulation to provide the Fruit Growers' Supply Company with a continuous supply of timber. An estimated total cut of 2,296,000,000 feet B. M. of virgin timber was budgeted at 50 million yearly for a 20 year depreciation period and 25 million yearly for 50 years more. Timber was to be marked to reserve the basis for an early second cut in 70 years, leaving as near to 30% of the volume as possible.

Block C, with the exception of a 7,000 acre local use area along Susan River Canyon, was set aside as a zone of operations for the Lassen Lumber and Box Company. Sustained yield on this area was out of the question. The Forest Service was obligated to supply the Lassen Lumber and Box Company with an approximate annual cut of 25 million feet B.M. for a period of 20 years. An estimated cut of approximately 495,000,000 feet B. M. of timber was budgeted at 25 million yearly for 20 years.

Timber was to be marked for maximum increment percent. After the cutting was completed a long period would elapse before another cut

could be made.

The plan also recommended the acquisition of cutover lands suitable for timber production.

The plan was based on a 5% cruise, S. B. Show's Yield Capacities of Pure Yellow Pine type under east side conditions, and fifty acres of representative sample marking plot data.

This revision of the management plan substitutes data gathered under actual working conditions in the first fifteen years of operation of the plan and supplements it in the light of economic developments,

The basic data consist of:

1. A 10% cruise of the cutover area, (4 acres of strip per forty).
2. A 1% sample of reproduction (8 plots of 1/20 acre each per forty).
3. A careful record of timber cut from each unit.
4. A type and site map.
5. Normal loss permanent sample strips, a total of approximately 20 miles or 320 acres on Government land.
6. Growth study for selectively cut Ponderosa and Jeffrey Pine. (Site index 130 ft.)

In addition the following data were gathered on Fruit Growers Supply Company land:

1. The Fruit Growers Supply Company cutover inventory cruise, which consists of a 100% tally of Sugar and Ponderosa Pine left on cutover land, an estimate of the White Fir left, and a .625 of one per cent sample of reproduction (4 plots of 1/16 acre each, per forty).
2. Normal loss permanent sample strips, about $16\frac{1}{2}$ miles of strip with a total area of 262 acres.
3. Type and site map.
4. Approximately 1,000 increment core measurements in Ponderosa and Jeffrey Pine, as a growth study check.

The revision retains the 120 year rotation and the 70 year first regulatory cutting cycle and with slight modification the Block divisions A and C. Modifications in marking practice in Block C are recommended. Blocks B and D have been abandoned in designating divisions of the working circle, and logging chance divisions have been substituted for convenience in designation.

Estimates have as a whole proven accurate. Both companies have secured much of their log supply from The Red River Lumber Company lands and other private owners.

The Fruit Growers have averaged a cut of slightly less than 30 million a year instead of 50 million a year, and now are limited to a maximum average cut of 35 million for the remainder of the present sale.

The Lassen Lumber and Box Co., has logged an average of 14 million feet of Government timber per year instead of 25 million, and now is limited to a maximum average of 20 million feet B. M. a year.

The present plan recognizes the probability of change in economic conditions and development of methods of logging, also technical processes. However, it is written for present conditions and present day utilization standards.

All data are as of December 31, 1935.

11. SUMMARY

1. LOCATION

East Side region of California. Parts of following Townships:

27N., R. 13 and 14E.
28N., R. 10, 11, 12, and 13 E.
29N., R. 8, 9, 10, 11, and 12E.
30N., R. 8, 9, 10, 11, 12, and 13 E
31N., R. 6, 7, 8, 9, 10, 11, 12, and 13E.
32N., R. 5, 6, 7, 8, 9, 10, and 11 E.
33N., R. 5, 6, 7, 8, 9, and 10E.

Area Gross Acres Inside Forest Boundary	410,000	acres.
" " " Outside " " 158,000	"
Total	568,000	"

TIMBER MANAGEMENT PLANS
LASSEN NATIONAL FOREST
EASTERN LASSEN WORKING CIRCLE



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2. AREA AND VOLUME OF MERCHANTABLE STAND

Table No. 1
(Volume given are net estimated cut)

	Government			Private			Total			Area cut
	Uncut	M. Ft. B. M.		Uncut	M. Ft. B.M.		Uncut	M. Ft. B.M.		
	Timbered:		Other	Timbered:		Other	Timbered:		Other	Acres
Block	Acres	Pine	Species	Acres	Pine	Species	Acres	Pine	Species	
A	144,445	1,487,496	181,357	35,895	500,456	154,924	180,340	1,987,952	336,281	25,350 Gov't. 18,000 Priv.
C	24,506	259,711	67,459	2,020	28,000	19,000	26,526	287,711	86,459	19,710 Gov't. 3,560 Priv.
Outside										
Includ.:	480	2,700	2,200	90,000	965,739	315,809	90,480	968,439	318,009	40,000 Priv.
Diamond:										
Mt.										
Totals	169,431	1,749,907	251,016	127,915	1,494,195	489,733	297,346	3,244,102	740,749	45,060 Gov't. 61,560 Priv.

2,197,384
502
2,689,386

3. ROTATION

One hundred and twenty years. Based on culmination of mean annual increment. Site index 120 feet. Average tree 15.4" D.B.H. Cutting cycles: 70 years for first regulatory cutting - 30 years for second regulatory cutting. (See Page 20 Rotation and Cutting Cycle for explanation of overlap.)

4. SILVICULTURAL SYSTEM TO BE USED

Selection: Removing 70% to 85% by volume, or about 50% by number, of the trees twelve inches and over D.B.H.

5. YEARLY YIELD

(a) Government

Blocks A and C - about 200,00 timbered acres:

44 to-

48 million to 195585% pine (Two plants)

30 " 1956 to 199070% " (One plant)

40 " 1991 to 2020

40 " second rotation

(b) Private

In whole working circle there is about 200,000 timbered acres.

It is estimated that 400 million of Red River Lumber Company timber will be cut at Susanville.

47 million 1935 to 1945 pine

7 " 1946 to 1990 "

6 " 1991 to 2020

30 " to 40 million - second rotation beginning about 2020.

It is apparent that a strong effort must be made to supplement the cut from about 1956, when presumably there will be little or no private timber left, to 2020. To do this, there is about one billion feet of mature fir timber, at present unmerchantable, both Government and private.

111. PHYSIOGRAPHIC FEATURES

1. TOPOGRAPHY

The Eastern Lassen Working Circle is situated on the high volcanic plateau region in northeastern California, which varies in elevation from 4200 feet at Susanville, the milling center, to 5700 feet on the floor of Upper Susan River and Pine Creek Valleys, and to 7000 feet and over on the slopes of the old volcanic cones which rise from this plateau.

2. SOIL

Due to the porous nature of the soil surface in general, run off is very small and consequently erosion is negligible.

The best forest growth occurs on the porous residual soils on the well drained slopes. The soils with some exceptions are derived from lava ash and the disintegration of lava rock. In some parts of the Coppevale and Willard Chances the soils are derived from the dissection and disintegration of lava capped river channel deposits. The Diamond Mountain Block, a part of the Plumas Forest, lies along the abrupt fault scarp of the Sierras and the soils are granitic in origin.

Grass land types have developed on the poorly drained valley floors. The formation of a clay pan, which holds water on the surface in the spring, has made this soil unsuitable for growing forests.

Float rock types have developed in places. These support a sparse growth of grass and sage. This type often occurs on the valley floor where the valley filling material consists of volcanic mudflows carrying quantities of rock and boulders. Sheet erosion has removed the softer material and left the surface strewn with the harder materials. On these eroded areas the soil is clayey in texture and unsuitable for growing forests.

3. CLIMATE

(a) Precipitation

Data on climatic conditions are fragmentary. The Weather Bureau Station at Susanville, near the Eastern limits of the coniferous belt, was discontinued about 1917.

Official weather records were not kept from that time until 1926 when County officials started taking temperature and precipitation observations. Weather records are now taken at the

Forest Service Nursery at Susanville.

Precipitation at Susanville:

Mean to 191721.67 inches.

Mean 1930 to 193411.94 "

Soil survey of Honey Lake Area
(U.S.D.A.)

Recent observations at Westwood indicate that 50% more precipitation is received there than at Susanville. Observations in the field indicate that the precipitation from storms from the South is about the same for the Upper Susan River drainage as at Westwood, decreases somewhat in upper Pine Creek, and is still lower north and east of the line of volcanic cones formed by Prospect, Crater, Logan, Antelope, and Roop Mountains. Precipitation at the eastern edge of the working circle apparently falls below the annual amount that is required to support commercial timber growth, which seems to be about an average of 20 inches. In a cycle of dry years annual precipitation along this edge of timber growth decreases to an average of about thirteen inches. The working circle has just experienced such a dry cycle and heavy losses in timber along the eastern fringe have resulted.

Figure #2 is a summary of all records available and illustrates the swing of the precipitation cycle from wet to dry. (Appendix Precipitation Chart)

(b) Relative Humidity

Relative humidity during the summer months often drops as low as 4% and sometimes remains around 10% to 15% for days.

(c) Wind Movement

There is usually a regular strong southwest wind every day except in the fall. Periods of low air pressure in the fall are often followed by strong, dry, east winds of about three days' duration.

(d) Temperature

Winter temperatures vary from a minimum of 25° to 30° F. below zero at Lasco and Camp Ten to 10° below zero at Susanville. Summer temperatures vary from a maximum of 95° in the woods to 102° F. at Susanville.

Frosts may occur at any time during the summer in the woods, but usually the month of July is frost free. The frost free period at Susanville varies but usually is from about May 10 to September 22. (Soil Survey of Honey Lake Area. U.S.D.A.)

1V. FOREST DESCRIPTION

1. TYPES AND SILVICAL FEATURES

Commercial timber types are the pure ponderosa pine stands and the ponderosa pine-white fir stands. (There is a good deal of Jeffrey Pine mixed with ponderosa pine.)

Sugar pine occurs to a limited extent on better sites, is of poor quality, and has no special importance.

Pure stands of white fir or of red and white fir, cover considerable areas. These species are considered inferior for lumber purposes and the stands are of no present value.

Lodgepole pine occurs on the damp, poorly drained sites. A considerable amount of this species is cut for ties to build logging railroads.

2. FIRE SITUATION

This area as a whole is somewhat better situated from the standpoint of fire danger than the west slope of the Sierras. Nevertheless the high winds, low humidity, frequent occurrence of lightning storms, and the large number of hunters who use the country in the fall form a very real fire problem which demands a high degree of fire protection.

3. OWNERSHIP

Table No. 2

LARGE HOLDINGS

Area and Stand as of January 1, 1936.

Block	Government Timber		F. G. S. Company		R. R. L. Company		Totals		
	Uncut	Net Cut	Uncut	Net Cut	Uncut	Net Cut	Total	Total	Total
	Timbered	M. F. B. M.	Timbered	M. F. B. M.	Timbered	M. F. B. M.	Uncut	Net Cut	Cut
	Acres	All Species	Acres	Pine Only	Acres	Pine only	Acres	M.F.B.M.	Acres
Block A									
F.G.S. Co.									
Sale	47,595	538,336	7,595	79,473	2,320	29,417	57,510	647,226	25,350 Gov.
Optional	11,400	67,514					11,400	67,514	18,000 Priv.
Outside	85,450	1,063,003	12,260	188,582	13,720	202,984	111,430	1,454,569	
		1,668,853		268,055		232,401		2,169,309	
Block C									
L.L.&B. Co.									
Sale	8,600	136,916					8,600	136,916	18,380 Gov.
									3,560 Priv.
Outside	15,906	190,254			2,020	28,000	17,926	218,254	1,330 Gov.
Reop Mt.		Unmerch.			7,500	95,000	7,500	95,000	4,500 Priv.
Eagle Lake	480	4,900	7,160	121,019	13,080	228,500	20,720	354,419	1,320 "
Willow Cr.					22,320	219,200	22,320	219,200	1,000 Priv.
Piute Cr.					13,890	138,920	13,890	138,920	3,900 "
Cheney Cr.					12,560	125,600	12,560	125,600	2,000 "
Diamond Mt.					950	9,500	950	9,500	13,580 "
Totals	169,431	2,000,923	27,015	389,074	88,360	1,077,121	284,806	3,467,118	29,860 "
									45,060 Gov.

In addition there is 12,540 acres of private land bearing a stand of about 28 million feet B.M. of pine.

x Under management.

WHITE FIR IN EASTERN LASSEN WORKING CIRCLE

Unit	F. G. S. Company		R. R. L. Company		TOTAL	
	Acres	M. F. B. M.	Acres	M. F. B. M.	Acres	M. F. B. M.
		Fir Only		Fir Only		Fir Only
Block A.						
	7,595 Inside	27,544	2,320 Inside	13,188	9,915	40,732
	12,260 Outside	89,019	13,720 Outside	25,173	25,980	114,192
	#16,340	# 60,000			# 16,340	# 60,000
Block C						
			# 3,560	# 13,029	# 3,560	# 13,029
			2,020	19,000	2,020	19,000
Roop Mountain						
			# 4,500	# 16,470	# 4,500	# 16,470
Eagle Lake	7,160	54,499	13,080	82,600	20,240	137,099
Willow Creek			22,320	21,200	22,320	21,200
Piute Creek			13,890	69,000	13,890	69,000
Cheney Creek			12,560	12,560	12,560	12,560
Diamond Mountain			950	950	950	950
TOTALS	27,015	171,062	88,360	318,671	115,375	489,733
	#16,340	# 60,000	# 8,060	# 29,499	# 24,400	# 89,499
# Acreage and amount of mature fir on cutover areas						

Gross estimate of White Fir areas - U.S. land

Stephens	5,680	121,199	31% Pine (T 30 + 31N R 8E)
Swain	6,000	177,000	11% Pine
Up. Willard	5,035	97,282	20% Pine
Roop Mountain	1,400	14,000	10% Pine
Diamond Mt.	5,000	50,000	20% Pine
Total	23,115 Acres	459,481 Ft. M.B.M.	

4. GROWTH AND YIELD

Except for a small area near the town of Susanville, there is practically no true second growth in the Working Circle older than twenty years. Show's 1920 study gives the following results, which are based on utilization to a five inch top and eight inches D. B. H. Clark rule.

See also Graph #14C Appendix

Site Index	: Age of Culmination :	Yield per A. at 120 years Fully
feet	: of Mean Annual In- : Stocked Stands.	
	: increment Board Feet :	
	:	Bd. Ft.
151	120 Years :	74,000
131 - 150	130 " :	56,000
111 - 130	130 " :	40,700
91 - 110	140 " :	26,000
71 - 90	150 " :	14,000
:	:	:

This study is the basis for setting the rotation at 120 years.

A growth study was made in 1922 by A. E. Wieslander on selectively cut pine stands. This study was based on the rate of growth of individual trees of the type left in marking on National Forest Sales. All of the growing stock data so far accumulated have been compiled in accordance with this prediction table. It checks very well with Meyers' prediction tables, (*) and indicates a growth of about 3% or 100 board feet per acre, per year for a period of 70 years.

A growth study was made in 1935 in the scanty reserve stand of pine left on private land. This study indicates a growth of about 2% or 18 board feet per acre per year for a period of twenty years.

Mr. Show recommended that the minimum rotation practicable for the Eastern Lassen should be 120 years. This was based on measurements of even aged stands of small patches of second growth.

In practice it will be a century before the present stand of old timber will be entirely out of the picture. The second growth stand resulting will be uneven aged and cutting method will be essentially a selection of marketable trees. The harvesting of a tree will depend more upon whether it fulfills the requirements for merchantability than upon any exact determination of age. Also the north row of townships in block "A" averages a site-index of only 110 to 115 feet, for which a rotation of 140 years is indicated.

*Technical Bulletin #407 U. S. D. A.

For these reasons the statement that the rotation is set at 120 years must be qualified. It is very likely that the class of tree most in demand will be a codominant or released intermediate. Probably these trees will range in age from 140 years upward. They will have started under the shade of older trees and grown slowly, putting on height but very little diameter growth and cleaning their stems of branches until partially released by cutting. They will produce lumber which contains small tight knots and the first log of each tree will contain a fair percentage of clear material. Trees which grow as dominants or in isolated positions produce low quality lumber and reach a large diameter in a relatively short time. Except as needed for seed these trees will probably be taken out as soon as possible with the purpose of improving the stand.

V. THE ECONOMIC SITUATION

1. TOWNS AND COMMUNITIES

Previous to 1910 Lassen County, in which the Eastern Lassen Working Circle is located, was a stock raising region whose principal source of revenue was from the sales of livestock, hay and grain. Several small sawmills were in intermittent operation. A branch of the land office was located in Susanville and considerable revenue came into the County through land colonization. The County Government was dependent to a large extent on the revenues derived from taxes on Red River and Pennsylvania Lumber Company timber lands.

The Red River Lumber Company of Minneapolis started exploitation of the region in 1913 and a railroad line was completed from the Southern Pacific Railroad at Fernley to the site of the proposed plant at Westwood. The town of Westwood now has about 5,000 inhabitants.

Several years later the Lassen Lumber and Box Co. established a plant at Susanville and contracted a Government timber sale in November 1917. With the establishment of this plant Susanville entered a boom period which was accelerated by the establishment of the Fruit Growers Supply Co. plant in 1919. This company started cutting in 1920 and contracted a large sale (900 million feet B. M.) of National Forest stumpage in April 1922.

The Lassen Lumber and Box Company has no investment in timber, and its life will be at an end with the exhaustion of the

McCoy and Willard Chances. The Fruit Growers Supply Company is organized on a sustained yield basis to supply the citrus growers of Southern California with box shooek and building material. Their timber investment amounted to one billion feet of standing timber, of which about half is still uncut.

The community has expanded rapidly, built extensive public improvements, has a heavy bonded indebtedness and local boosters have unwisely placed the community in a precarious position financially, in view of the rapidly dwindling resources of the County. See appendix for tabulation of the County financial report.

2. WOOD-USING INDUSTRIES

Wood-using industries which draw on the Eastern Lassen Working Circle:

	Maximum Capacity	Aver. Cut Million Ft.
The Red River Lumber Co.	250 million feet	180
Fruit Growers Supply Co.	100 " "	70
Lassen Lumber & Box Co.	50 " "	35
Springfield Cedar Co.	20 " "	5
	<u>420</u> " "	<u>290</u>

No National Forest timber in the Working Circle is obligated to The Red River Lumber Co., or the Springfield Cedar Co.

3. PAYROLLS

	: F.G.S.Co.	: L. L. B. Co.	: T.R.R.L. Co.
*Payrolls yearly	: (estimate)		
	: \$: \$: \$
Average previous to depression	: 1,098,000	: 536,315	: 3,000,000
	: (1929)	:	:
Depression payrolls	: 509,000	: 166,812	: 1,500,00
	: (1933-34)	:	:
	:	:	:

*Includes subcontractors.

4. MARKETS

The local market absorbs a very small proportion of the cut. Most of the lower grades of lumber are manufactured into box shooek for the California fruit industries. The upper grades are sold in the general market and shipped all over the United States.

Cedar is cut principally for pencil stock.

5. TRANSPORTATION

The main line of the Western Pacific Railroad traverses the western part of the Working Circle passing through Westwood. A branch line of the Southern Pacific Railroad starting at a point near Reno passes through Susanville and terminates at Westwood. The Fruit Growers Supply Company has a logging railroad from their woods camp into Westwood Junction. From there logs are hauled over Southern Pacific tracks to Susanville. The Red River Lumber Company has built a logging railroad from Westwood Junction through their holdings on the slopes of Roop Mountain to Susanville.

Susanville is connected by paved highway with Reno, Westwood, Red Bluff and Quincy. These roads are open the year round. In addition there is an extensive system of dirt roads all through the County. Practically all travel is by automobile and most freight except logs and lumber is hauled by trucks.

This duplication of transportation facilities holds the threat that the Southern Pacific line may become unprofitable and may be abandoned.

6. NON-WOOD-USING INDUSTRIES

The following estimate of the income from farm and livestock industries was made by the Farm Bureau Agent.

Dairying	\$240,000
Poultry	110,000
Cattle	215,000
Sheep	330,000
Hogs	17,000
Horses	20,000
Crops & garden	40,000
Total	972,000

Revenue derived from the mining industry is negligible.

The recreation business is important and growing, but is hard to value in terms of direct income.

7. OWNERSHIP SITUATION

See table #2 for ownership by blocks.

The large holdings of The Red River Lumber Company constitute a serious obstacle to the orderly regulation of cut in this Working Circle. Taxes and bond interest have forced this

company to liquidate their timber investments, upsetting orderly cutting schedules through bargain sales of sawlogs to the Fruit Growers and Lassen Lumber and Box Companies. A "cut and get out" policy has resulted in reckless logging methods and destructive slash disposal practices, which means a serious handicap to the future welfare of the community.

These lands are potentially the most productive in the Working Circle. They should be so cut and protected that they will remain productive, since they represent a potential source of supply equal to 30% of the Working Circle. They are largely located close to Susanville, and could be given a more intensive degree of silvicultural management than is possible in the more remote stands.

There are several alternative plans by which this bad situation might be overcome. These plans are also discussed in detail in the appendix.

1. Federal acquisition of virgin timber.
2. Federal acquisition of cutover lands under a pre-cutting agreement.
3. Assumption of fire protection burden by the Forest Service.
4. Acquisition by one of the lumber companies, at Susanville, and installation of conservative logging and adequate fire protection systems.

Alternative #1 seems impossible of attainment for obvious reasons, although it is the most desirable and would be the best for the community as a whole over a period of time.

Alternative #2 is practical if certain minor difficulties could be ironed out and provided legislation could be secured allowing acquisition outside the present National Forest boundaries. The cutting agreement would have to be very simple and free from irksome or expensive requirements, in order to secure the land at a low figure, and it would be necessary to take over the slash protection burden immediately after the loggers completed work in order to relieve the company of the pressure to dispose of it by the cheap and simple, but destructive, method of broadcast burning. The County Government would have some objections, which would have to be ironed out.

Alternative #3 is not legally possible. It would mean the expenditure of Federal funds on private land to put in a fire control system of burned strips, roads, snag elimination, detection, and suppression.

Alternative #4 is practical and is the only way in which one of the lumber companies might insure a long life at present production rates. A very satisfactory solution of this management problem can be worked out through a combination of alternatives 2 and 4.

THE MANAGEMENT PLAN

I. OBJECTS OF MANAGEMENT

1. To grow timber suitable for the manufacture of box shook, lumber and other forest products and to regulate the supply, thereby insuring the permanency of the community.

2. To correlate other uses of land in the Working Circle through administrative coordination in order to develop the fullest use of the land for the greatest good to the greatest number in the long run.

Object No. 1: To grow timber and regulate the supply. This presupposes protection from fire, diseases, insects and soil deterioration. The following policies are in effect:

(a) To furnish the Fruit Growers' Supply Company a continuous supply of timber suitable for box shook and lumber. This operation was started in 1919 by the Citrus Growers of Southern California to insure a stable supply of box shook and lumber at a reasonable price. It gives promise of future stability.

(b) To supply the Lassen Lumber & Box Company with timber sufficient to depreciate their plant and thereby discharge certain obligations contracted when the company located their plant at Susanville. This obligation will be discharged upon completion of their present contract and when they have been given an opportunity as agreed to bid for the timber in the Willard Chance. It was desirable at that time to make a regulatory cutting on a large area of virgin timber land deficient in intermediate age classes.

The Working Circle has reached that stage where good regulation calls for a husbanding of the reserve of virgin timber. This is necessary so that there may^{be} no hiatus in the supply of merchantable forest products, before the time when young growing stock can be brought to maturity.

(c) To acquire such alienated lands as are not being managed for a sustained yield in order that the productive capacity of the Working Circle may be kept at a maximum.

(d) To reforest artificially, areas denuded by fires.

(e) Soil conservation.

Object No. 2: To correlate other uses of land. The principal uses are recreation and grazing. This is discussed fully under Administrative Correlation.

II. SILVICULTURE

1. METHODS OF CUTTING

(a) Government Land

Dunning's tree classification system is used as a guide in marking timber for cutting.

Under present market conditions only pine and cedar can be manufactured with sufficient profit to allow the securing of desirable utilization. Fir is hard to work with machinery adapted for pine and there is very little demand for the finished product. It is hoped that eventually fir timber may become economically useable to a greater degree.

The marking policy on the Eastern Lassen Working Circle is to remove the deteriorating timber in the shortest possible time consistent with maintaining a sustained annual yield. As near to thirty percent of the original stand as possible is left standing in order to serve as a basis for an early second cut. See appendix for marking rules.

The application of these principles has resulted in a fairly thrifty stand of ponderosa pine, deficient of course in the diameter classes of four to eighteen inches D.B.H.

The reserve stand of white fir is not so satisfactory. Economic conditions have forced the leaving of as much as possible of this species. The insect loss has been very heavy on the poorer sites. It is questionable whether much of this stand will last until the next cutting cycle.

(b) On Fruit Growers Supply Company Land

Due to economic conditions it has not been possible for the company to remove white fir since 1924. It has been the policy to leave a reasonable nucleus of pine seed trees. This has resulted in leaving the following growing stock on some 18,000 acres:

	Average Per Acre (262 Strip Acres)					
	Pine		Fir		Cull Material	
	Volume	B. M. No.	Volume	B. M. No.	Feet	B. M.
Poles	--	10.7	--	24.8	--	--
Timber	959	4.6*	2770	7.0**	6500	

*Classes 1 to 6 inclusive.

**Sound trees.

Pine averages: 38%, #1, 2, and 45%, #3s. by gross volume.

Fir averages: 17%, #1 and 2, and 17½%, #3s. by gross volume.

The policy of the company in marking pine is to leave all #1, 2, and 6 trees. A certain number of #3 trees, and also a certain number of that class of trees which have the thrifty appearance of a #2 tree, but are over 150 years in age, are marked to leave. Number 7 trees are cut if they contain a good saw log.

(c) On Other Private Lands

Other private lands have been cut-over in several ways. A large part of the Diamond Mountain and Piute blocks were logged with trucks. Skidding was done mostly by horses or tractors. Where slash was not burned there is a very excellent stand of small trees which will compare favorably with the stand left on the Fruit Growers' cut-over land. Two hundred chains of strip (twenty acres) taken where slash burning was not severe indicates an average stand of about 1900 board feet of pine after burning. This represents 76% of the stand left after logging, 24% having been lost in burning.

Due to the fact that the private lands are as a whole of better site quality than the Government lands, increment in white fir will probably balance loss.

2. METHODS OF BRUSH DISPOSAL

(a) Government Land

Fruit Growers Supply Company and Lassen Lumber & Box Company operations.

30,500	acres piled and burned, snags felled.
<u>12,500</u>	" fire lines, snags felled
43,000	total acres cut-over

(2,060 acres no treatment)

(b) Fruit Growers Supply Company Land

(Includes small miscellaneous holdings cut by this company.)

3,000	acres protected by patrol, snags felled or burned
<u>15,000</u>	" fire lines, snags felled or burned
18,000	total acres cut-over

	(1930)
Cost of brush piling and burning	\$7.90 per acre
Cost of fire lines, average	4.57 " "

Slash conditions are satisfactory in the private cuttings made about fifteen years ago. Slash has rotted and disintegrated to such an extent that it no longer constitutes an unusual fire hazard.

The fire line method is more effective than piling and burning on areas of light stands, where reproduction is dense, where there are many snags and windfalls or where the material which would ordinarily be removed by piling and burning constitutes a small part of the flash material. This is particularly the case in the scanty mixed fir and pine type of Site 3 and lower, where insects have killed a large part of the white fir.

The cost of brush piling on the Fruit Growers sale is high. This is due to the open grown full crowned trees which bear a greater volume of limbs and needles than do the scanty crowned trees in dense stands, and to the use in later years of machinery which breaks down a larger proportion of young growth.

Total cost of brush piling can be reduced by leaving brush in place on certain thinly timbered areas where the slash does not constitute a serious fire menace.

The fire lines built in the Bridge Creek Unit on the better sites have remained open with very little maintenance and are still effective after eight years.

The fire lines built on the poorer sites in the Logan Mountain Unit areas are as a whole less effective because of the rapid growth of brush and herbaceous plants.

Good detection has held loss from fire to a minimum on all types and sites regardless of brush disposal methods. The fire line system is the cheapest and is satisfactory providing the Fruit Growers Supply Company has a regular sized woods crew each year and providing the fire lines are regularly maintained.

3. METHODS OF LOGGING

Logging methods have changed radically since the first sale was made in this Working Circle.

The Lassen Lumber & Box Company started with horses and slip-tongue wheels. They changed in 1927 to caterpillars and slip-tongue wheels.

The Fruit Growers Supply Company started with horses and slip-tongue wheels and also "boom-donkeys". In 1926 they changed entirely to caterpillar logging. Various methods were tried until the fair-lead track-layer wheel was developed. Logging has been done with tractors and fair-lead wheels since 1932.

4. SILVICULTURAL STUDIES

A good deal of silvicultural study work has been done in the Eastern Lassen Working Circle. Two experimental forests have been set aside, one in pine and pine-fir type, and the other in red fir and red fir-white fir type.

(a) Conducted by Experiment Station

Early studies conducted by the Experiment Station are as follows:

1. Two sample plots in ponderosa and Jeffrey Pine to determine rate of growth on cut-over land and to determine effect of different degrees of cutting on rate of growth.

2. Sample plots in pure fir pole stands to determine the effect of different thinning methods. With the recent establishment of a field station near the Blacks Mountain Experimental Forest a much more comprehensive program of research in timber and range management has been made possible. Plans are made for a "series of coordinated studies of management, economics, utilization and silviculture."

(b) Conducted by Administrative Force

1. Ten percent cruise of cut-over area tallying leave trees by size, crown class, and thrift; and tallying reproduction by size and degree of stocking. Stock and stand tables are prepared for each section cut.

2. A gridiron system of permanent normal loss plots (see map in appendix) to determine:

Loss in reserve stand following logging by cause, crown class, and species.

Current check on changes in composition of young age classes through growth, reseeding and losses.

Current check on rate of growth of reserve stand.

3. Planting studies

Areas in need of planting

Class of stock

Correlation of soil moisture with survival

Brush eradication.

4. Slash disposal experiments to determine relative cost and effectiveness of different methods.

5. Brush eradication studies as related to fire line construction.

(c) Conducted by Bureau of Entomology

1. Sample plots to check on rate of loss from insects.

III. REGULATION

1. ROTATION AND CUTTING CYCLE

(a) Government Land

Refer to figures eleven a, b, and c (distribution of age classes), twelve a, b, and c (growing stock diagrams), and to timber supply diagram for the Eastern Lassen Working Circle. These figures are also included in the study of the Fruit Growers cut-over lands.

It is apparent from diagram number eleven that, provided economic conditions make it possible to utilize the small average trees (sixteen inches) grown in a 120 year rotation, it will be 100 years after cutting before a normal succession of age classes commence to mature. At this point, it is noted that the new crop is already roughly 20 years old and therefore the rotation has an overlap of roughly 20 years on the start of first regulatory cutting for the bulk of the area cut so far. Therefore 100 years is the minimum time set up for a series of regulatory cuttings. Past economic conditions have led to the adoption of tentative 70 and 30 year cutting cycles. (Changes in conditions may lead to a larger number of lighter cuttings to remove the old growth.)

It is calculated that following the first cut (see figures twelve a, b, and c) one liberation cutting can be made on Government land to remove most of the seed trees and poles that have attained a diameter of eighteen inches or more. A good timber inventory cruise will be necessary at the time of exhaustion of the virgin timber in order to set up an orderly cutting budget for this short thirty year cutting cycle.

During this cutting cycle, the first part of the cut will be in stands which have been released for seventy years. The last cutting will be in stands released only thirty years. This will result in a cutting budget based on equal yearly volumes, and perhaps very unequal acreages. The best estimates indicate an average

release age of fifty years and an average cut of 6,000 board feet per acre for this cutting cycle. This indicates an allowable annual cut of about forty million board feet.

Beginning about the year 2020 on the area as a whole a fairly normal succession of age classes will have been established. The third cutting cycle will remove trees which were seedlings and saplings at the time of removal of the virgin stand. These constitute about 40% to 50% of the present stocking distribution. The estimate of the allowable cut for the third cutting cycle is derived from Show's yield capacity diagrams for the east slopes of the Sierra Nevada Mountains of California (Tables 13a, 13b, 14a, 14b and 14c,) which indicates an average yield of about fifteen thousand board feet per acre and a total allowable annual cut of about forty million board feet. Show's figures are discounted 25% to allow for firebreaks, skid roads, blanks, etc. See appendix for graphs.

The fourth cutting cycle will remove trees which started in openings following the first logging or trees which were released at time of removal of the seed tree reserve. This cutting should also yield about fifteen thousand board feet per acre or forty million board feet annually for the Working Circle.

The cutting should ultimately conform to a schedule of two cutting cycles per rotation. Each cutting will remove 15,000 to 20,000 board feet per acre of trees 120 to 180 years old, whose first period of growth occurred under the shelter of older trees. These trees will have been partially released for sixty years and wholly released for an additional sixty years. In the more accessible areas, it will probably prove practicable to conduct improvement cuttings for fire wood and other products. It may also be desirable to make selection cuttings at fairly short intervals. Any such intensive utilization will increase the total yield for the Working Circle.

Due to the slowness and uncertainty of reproduction in this region, clear cutting will not be a successful silvicultural method. Essentially each area to be cut will have three age classes occurring in groups or in a heterogeneous mixture, as follows:

- About 45% of area in 120 to 160 years old class.
- About 45% of area in poles 60 to 90 years old.
- About 10% of area in reproduction age 0 to 30 years old, and in addition, a certain amount of suppressed reproduction all through the older stands.

After cutting each area will have two general age classes as follows:

- About 45% of area in poles sixty to ninety years old.
- About 35% of area in reproduction zero to thirty years old, and in released reproduction.
- About 20% of area non-stocked.

(b) Private Land

Refer to diagram 12c, 11, and 15. Diagram 11 indicates that where reproduction has been conserved, a fairly normal succession of age classes will commence to mature about 100 years after removal of the virgin stand.

During this regulatory period there is a stand of partly defective fire that should be cut to liberate thrifty growth. There is also a scanty reserve stand of thrifty pine and fir which can be picked over toward the close of this period.

It is assumed that the virgin stand of pine in Fruit Growers ownership will be pooled with the Government timber in order to furnish a steady uniform cut. The Fruit Growers Supply Company timber will average an annual cut of about seven million board feet for fifty-five years, or until 1990. Following this, a short cutting cycle of thirty years corresponding with the short cutting cycle on Government land will yield annually about six million board feet. On the average this stand will be released about fifty years. This cut will be taken from the 200,000 acres in private ownership, control of which must be secured.

Supplementing the Fruit Growers Supply Company's virgin timber, is probably four hundred million board feet of pine out of the billion feet in Red River ownership which must be split with the Lassen Lumber & Box Company and the Springfield Cedar Company. This timber is on the market now and will be cut within a period of about ten years unless the Fruit Growers should be able to acquire a block for deferred utilization.

In the timber regulation set-up it is assumed, and it is vitally necessary, that all other private timber growing land will be acquired by the Government or by the Fruit Growers Supply Company, and will be put under management.

If this acquisition and management program is successful it will be possible in about 100 years time to gradually develop a steady average annual cut of at least seventy million board feet, and to increase that total annual cut to a point where it may prove advisable to revise the limits of the Working Circle to shift the farthest removed portions into other working units.

From the time that The Red River Lumber Company timber ceases to be available until the time when the second rotation starts there will be a period of scanty supply. There is about one billion feet of virgin fir timber which could be logged at this time if economically possible. This estimate includes mature fir left on private lands at the time of first cutting, and heavy fir areas in the Plumas and Lassen Forests now considered unmerchantable.

There is also the alternative of confining the cut to one operation with the termination of the present sale to the Lassen Lumber & Box Company.

Another small relief would be the reservation of the Coppervale Chance for operation to Susanville instead of Westwood. However, this timber seems of more value as trading stock in the acquisition program, so necessary to the whole scheme. For example, the acquisition of the high grade cutover lands between Coppervale and Westwood, Township 29 North, Ranges 8 and 9 East, and its temporary allotment to the Eastern Lassen Working Circle would provide more pine timber for the Susanville plant between the years 1955 and 1995 than is now standing in the Coppervale Unit.

2. CALCULATION OF ALLOWABLE CUT

(a) Block A

(1) National Forest Timber

As calculated in the original management plan Block A could yield an average annual cut of thirty million board feet for the first cutting cycle of seventy years, ending in 1992. In the recalculation, the year 1990 has been set as the end of the first cutting cycle.

Although a cut of fifty million yearly was authorized in the sale contract of April 3, 1922, it has averaged 29,334 M.B.M.

The recalculation at this time of the average allowable cut is as follows. This includes all merchantable optional areas, except a heavy fir area in the southwest corner of the block.

	<u>Cruise</u> <u>M.B.M.</u>	<u>Cutting</u> <u>Factor</u>	<u>To Cut</u> <u>M.B.M.</u>	<u>% Cut</u>
P. P.	1,840,072	80	1,472,058	88.21
S. P.	19,265	80	15,412	.92
W. P.	33	80	26	-
W. F.	374,988	40	149,995	8.99
R. F.	20,203	40	8,081	.48
I. C.	26,377	80	21,102	1.26
L. P.	8,716	25	2,179	.13
Total	2,289,654		1,668,853	99.99

$$\frac{1,668,853}{55 \text{ years}} = 30 \text{ million}$$

Within the present sale area 4/3/22 (3/10/36), the cruise shows the following stand uncut:

	<u>Volume</u> <u>M.B.M.</u>	<u>Cutting</u> <u>Factor</u>	<u>To Cut</u> <u>M.B.M.</u>	<u>1936</u> <u>Reappraisal</u> <u>M.B.M.</u>
P.P.	679,070	86	580,000	366,511
S.P.	10,988	86	9,500	7,318
W.F.	109,100	40	44,000	61,514
I.C.	12,170	80	9,700	6,850
R.F.	784	40	300	-
L.P. (Optional)	<u>444</u>	<u>25</u>	<u>111</u>	<u>-</u>
Total	812,556		643,611	442,193

Red and white fir combined cutting per cent is derived from the cutting records and is the product of the cutting per cent and cruise correction factor.

Reappraisal calculations have been made on the basis of an estimated remaining cut of 442 million because of the relative inaccessibility and poor quality of some of the timber, and because of the threatened insect loss on the poorer sites. It represents an estimate that is almost certain to be available to the company barring disastrous fires.

Provision is made in the new contract that in the event a surplus develops because of the utilization of optional timber, or cessation of insect attacks, the company will be allowed to exceed the maximum contract cutting limitation to the extent allowed by the surplus for that period.

The cutting control sheet for the old sale 4/3/22 shows a surplus of 187 million feet B. M. of timber having been built up on the average maximum cut permitted for the twenty year period. Similarly it is anticipated that a surplus will be built up under the new contract.

(2) Cutting Control Tabulation, Fruit
Growers Supply Company, 4-3-22.

Period -	:Permitted Average:					
	:Cumulative Cut :			Record of Cut :		
	: Year	: Volume	: Per Year	: Cumulative	: Surplus	: Deficit
1922 to 1942	: Bd. Ft.	: Ft. MBM	: Ft. MBM	: Ft. MBM	: Ft. MBM	: Ft. MBM
Limitation of Cut	: 1922	: 42,700	: 13,376	: 13,376	: 29,324	:
854,494 (revised)	: 1923	: 85,400	: 19,146	: 32,522	: 52,878	:
Average annual cut	: 1924	: 128,100	: 34,480	: 67,002	: 61,078	:
board feet 42,700	: 1925	: 170,800	: 27,921	: 94,923	: 75,877	:
M. B. M. (revised)	: 1926	: 213,500	: 36,604	: 131,527	: 81,973	:
	: 1927	: 256,200	: 38,376	: 169,903	: 86,297	:
	: 1928	: 298,900	: 29,582	: 199,485	: 99,415	:
	: 1929	: 341,600	: 29,328	: 258,813	: 82,787	:
	: 1930	: 384,300	: 47,557	: 306,370	: 77,930	:
	: 1931	: 427,000	: 39,535	: 345,905	: 81,095	:
	: 1932	: 469,700	: 31,683	: 377,588	: 92,112	:
	: 1933	: 512,400	: 1,868	: 379,456	: 132,944	:
	: 1934	: 555,100	: 29,356	: 408,812	: 146,288	:
Average to	:	:	:	:	:	:
12/31/35 -	: 1935	: 597,800	: 1,876	: 410,688	: 187,112	:
29,334 M.B.M.	:	:	:	:	:	:
(443,808 left)	: 1936	: 640,500	:New Sale Contract Drawn			:
	: 1937	: 683,200	:Old Sale:Cancelled :			:
	: 1938	: 725,900	:	:	:	:
	: 1939	: 768,600	:	:	:	:
	: 1940	: 811,300	:	:	:	:
	: 1941	: 854,000	:	:	:	:
	: 1942	: 854,494	:	:	:	:
	:	:	:	:	:	:

The new sale provides a minimum average annual cut of twenty million and a maximum average annual cut of thirty-five million. The cutting control sheet is as follows, based on an average annual cut of the maximum allowed.

Fruit Growers Supply Company Sale - 3-10-36

	: Permitted Aver. :		: Cumulative Cut :		Record of Cut		: Surplus :	: Deficit :
	: Volume :		: Per Year :		: Cumulative :			
Period	: Year :	: MBM :	: Ft. MBM :	: M. B. M. :				
1936 to 1949	: 1937 :	: 35,000 :	:	:	:	:	:	:
	: 1938 :	: 70,000 :	:	:	:	:	:	:
Maximum permitted	: 1939 :	: 105,000 :	:	:	:	:	:	:
105 million for each	: 1940 :	: 140,000 :	:	:	:	:	:	:
three year period	: 1941 :	: 175,000 :	:	:	:	:	:	:
	: 1942 :	: 210,000 :	:	:	:	:	:	:
	: 1943 :	: 245,000 :	:	:	:	:	:	:
	: 1944 :	: 280,000 :	:	:	:	:	:	:
	: 1945 :	: 315,000 :	:	:	:	:	:	:
	: 1946 :	: 350,000 :	:	:	:	:	:	:
	: 1947 :	: 385,000 :	:	:	:	:	:	:
	: 1948 :	: 420,000 :	:	:	:	:	:	:
	: 1949 :	: 442,219 :	:	:	:	:	:	:
	:	:	:	:	:	:	:	:

(3) Optional Areas

To cut 140 to 200 million feet B. M. situated on Campbell Mountain, Crater Mountain, Ashurst Mountain, Cave Mountain, Dow Buttes, Brockman Flat, and adjacent slopes of Antelope Mountain. This should provide an additional annual cut of ten to fifteen million feet for the period of the sale.

Current check will be made of the cut against cruise, as cutting proceeds into the northeast corner of the sale where insect loss has been severe.

It is anticipated that at some period, probably 1940 to 1945, the Fruit Growers Supply Company will be so situated that they will need an annual cut of about sixty million feet from Government land for several years. Credited surplus accumulated from minimum cuts and optional areas will be used during this period. The maximum contract requirements at this time will be formally waived for the amount necessary to keep this plant on a reasonable production rate. This is taken care of in the contract revision of 1936.

Balance of Block A. Merchantable Stand.

Species	: Cruise : M B M	: Cutting : Factor	: Estimated : Cut M B M
Ponderosa Pine	: 1,161,002	: 80	: 928,801
Sugar Pine	: 8,277	: 80	: 6,621
White Pine	: 33	: 80	: 26
White Fir	: 265,888	: 40	: 106,355
Red Fir	: 19,419	: 40	: 7,767
Incense Cedar	: 14,207	: 80	: 11,365
Lodge Pole	: 8,272	: (25) ?	: 2,068
	: 1,477,098		: 1,063,003

Period to cut - 1950 to 1990

Average cut - 1,063,003 MBM - 26,500 MBM

40

To this will be added any accumulated surplus or optional area uncut in the present sale area. There is also a block of about 150 million feet of timber unmerchantable at the present time because of high per cent of inferior species.

(4) Regulation Policy and Sales Policy

As discussed in the preceding paragraphs, the Fruit Growers Supply Company has been given a new contract for the timber on an area of about 48,000 acres (timbered). This should last until 1949. When this area is cut out, all the remaining timber in the block will be pooled and a new sale or series of sales made to last until 1990. It is intended that the cut will average thirty million feet yearly of Government timber for balance of first cut. If the Fruit Growers exceeds this average cut at any time, it will result in a corresponding smaller cut at a future time.

(b) Block C

(1) National Forest Timber

This block should furnish the first cut in the second cutting cycle since logging started here in 1918, while logging in Block A did not start until 1922. The year 1990 is set as the end of the first cutting cycle.

As previously discussed, Block C is set aside as the Lassen Lumber & Box Company operating zone and as a reserve area for local use. This reserved area is not suitable for local needs and as soon as a more suitable area can be provided this

will be done.

It will not be possible to place the Lassen Lumber and Box Company on sustained yield. When this Company cuts out the Government timber and such private timber as they have been able to buy currently, their plant will be junked or moved.

Timber Available in This Block for This Operation:

Sale Area		P P	S P	W F	L P	Total
<u>11/16/17</u>	<u>Acres</u>	<u>MBM</u>	<u>MBM</u>	<u>MBM</u>	<u>MBM</u>	<u>MBM</u>
To Cut	8,600	111,699	2,691	22,526	No estimate	136,916

This should take from seven to ten years to log. In addition, the following chances are available: (Volumes are for total cruise).

	<u>Acres</u>	<u>P P</u> <u>MBM</u>	<u>S P</u> <u>MBM</u>	<u>W F</u> <u>MBM</u>	<u>D F</u> <u>MBM</u>	<u>R F</u> <u>MBM</u>	<u>I C</u> <u>MBM</u>	<u>L P</u> <u>MBM</u>	<u>Total</u> <u>M B M</u>
Willard	9,960	107,501	15,653	29,644	15,291	29	8,444	-	176,562
Susan Canyon (Reserve)	5,950	50,559	7,938	24,997	2,378	-	2,528	252	88,652
Upper Willard (Unmerch.)	<u>5,035</u>	<u>16,444</u>	<u>2,551</u>	<u>42,935</u>	<u>880</u>	<u>33,573</u>	<u>897</u>	<u>2</u>	<u>97,282</u>
Total	<u>20,945</u>	<u>174,504</u>	<u>26,142</u>	<u>97,576</u>	<u>18,549</u>	<u>33,602</u>	<u>11,869</u>	<u>254</u>	<u>362,496</u>

This should keep the operation running for at least ten years. A new contract revision is being drawn up with a minimum annual cut of ten million feet and a maximum annual cut of twenty million feet until July 1, 1940.

This reduction in cut, although bad from the administrative standpoint, allows the Lassen Lumber & Box Company to buy logs from The Red River Lumber Company while these are available and so prolong its period of operation.

In all, the Government timber available will probably keep the Lassen Lumber & Box Company supplied with logs for twenty years, or until 1956.

The cutting control sheet for this sale shows a large excess of cut-over minimum requirements up until the depression. Since this is not a sustained yield operation no maximum cut limitations were placed in the contract until the 1936 revision.

(2) Cutting Control Sheet, Lassen Lumber
& Box Company Operation

		: Minimum :				: :		
		: Cumulative :				: :		
		: Cut :	Record of Cut			: (Overcut) :		
		: Permitted :	Per Year :	Cumulative :	Surplus :	Deficit		
Year		M B M	M B M	M B M	M B M	M B M		
	1918	10,000	6,487	6,487				
	1919	20,000	17,485	23,972	13,972			
	1920	30,000	23,653	47,625	27,625			
	1921		20,476	68,101	38,101			
1922 Clause								
change 45 mil-								
lion each 3								
years								
	1922	45,000	30,662	98,763	53,763			
	1923	60,000	36,692	135,455	75,455			
	1924	75,000	17,928	153,383	78,383			
	1925	90,000	24,356	177,739	87,739			
	1926	105,000	34,827	212,566	107,566			
	1927	120,000	6,581	219,147	99,147			
1928 Clause								
change 60 mil-								
lion each 3								
years								
	1928	135,000	22,731	241,878	107,731			
	1929	155,000	12,891	254,769	99,769			
	1930	175,000	3,123	257,892	82,892			
	1931	195,000	--	257,892	62,892			
	1932	215,000	--	257,892	42,892			
	1933	235,000	--	257,892	22,892			
	1934	255,000	--	257,892	2,892			
	1935	275,000	--	257,892	--	17,108		
1936 Clause								
change 50 mil-								
lion each 5								
years								
	1936	285,000						
	1937	295,000						
	1938	305,000						
	1939	315,000						
	1940	325,000						

(3) Adjacent Local Community Supplies

In approving the first large sale to the Fruit Growers Supply Company, the Secretary of Agriculture, Houston, specifically stipulated the setting aside of a tract of timber sufficient to supply the future needs of the local community. Accordingly the Susan Canyon Chance was set aside for this purpose. No use has been made of this.

An analysis of the situation shows that the local situation was not well understood in ordering this reservation.

Local residents are well supplied by more accessible lands.

Susan Canyon is inaccessible by road for local use.

Insect loss is high in this area.

The Fruit Growers Supply Company, also Lassen Lumber & Box Company, and The Red River Lumber Company are in the general lumber business, and maintain local retail yards.

The management plan insures a sustained yield, thereby providing a local supply of lumber.

Timber awarded the Fruit Growers was not available for local use, being twenty-five to sixty miles distant from Susanville, but is made available by the development of this operation.

Forest products in demand for local use are as follows:

- Lumber
- Cedar fence posts and stubs
- Corral poles
- Derrick poles
- Radio poles
- Telephone poles
- Fire wood

Poles and fire wood are by-products of a lumbering operation, and stand improvement work also provides quantities of such material. It is planned to provide possibly two areas more accessible to Honey Lake Valley communities which will be more suitable for the purpose intended.

Until this can be worked out through exchange and purchase, the Susan Canyon reserve area will be retained to comply with the regulations even though no demand for a local use area exists.

IV. ADMINISTRATIVE CORRELATION

Under the heading Objects of Management have been outlined the various problems with which timber management is concerned. Correlation of timber management with the other uses of the property is discussed below.

1. ACQUISITION

(Purchase & Exchange)

Acquisition or control of 200,000 acres of private land is essential to the proper working out of this plan.

Necessary legislation has not been secured authorizing trades outside the Forest boundaries. Thirty-six hundred acres of virgin timber and 1240 acres of cut-over have been acquired inside the Forest boundaries. A large amount of time has been spent on land exchange work, but due to the fact that ownership is concentrated, little headway has been made with acquisition.

The Fruit Growers holdings are protected from fire, and are under a satisfactory system of management. Acquisition is of doubtful public benefit.

The Red River Lumber Company and its subsidiary, the Waland Lumber Company, are owners of large tracts of land adjacent to and within the Working Circle. Acquisition is essential to the working out of this management plan, but so far an agreement on valuations has not been arrived at for National Forest Reservation Commission purchases.

The Regional purchase price policy, both in exchange and purchases, precludes the possibility of the private owners practicing conservative brush and snag disposal on cut-over lands in anticipation of trading or selling to the Government. No differential in value is recognized between lands on which snags have been felled and brush carefully disposed of and on lands where no disposal was made of fire hazards.

There is approximately 50,000 acres of cut-over land outside exchange boundaries which should be acquired; 75,000 acres of virgin timber land is being rapidly cut and will be available for purchase within ten years. Strips run in cut-over show a stand of 2,000 feet of pine where slash fires were not set.

Damage in careful slash burning averages 25% of timber twelve inches and over, 50% of pole stand and 90% of seedlings and saplings. Damage in careless slash burning ranges up to total loss. The timber outside the Forest boundary tributary to Susanville differs from that in the rest of the Working Circle in that there is a larger percentage of intermediate age classes, and most of it is pure

ponderosa pine type. The opportunity for an early second cut in these blocks is very good provided a less destructive slash disposal system could be used.

2. RECREATION

The recreation problem on the Eastern Lassen has so far not presented any major points of conflict with timber management.

(a) Areas of Intensive Recreational Use

- (1) Silver Lake-Caribou
- (2) Susan River
- (3) Eagle Lake
- (4) Gold Run (Plumas Forest)) Privately owned

(1) Silver Lake-Caribou

The Silver Lake-Caribou area is one of poor timber growing capacity being mostly Lodgepole type. Timber cutting except in landscape work is not permitted. A local use area is set aside for the purpose of supplying house logs for building.

(2) Susan River

Susan River is used heavily by fishermen, and is a splendid small fishing stream. Great care will be taken in logging land in this drainage to prevent the possibility of erosion and the silting up of trout pools.

(3) Eagle Lake

Eagle Lake is a large body of water controlled by private holdings. There is heavy use of this lake by bathers. Boating is increasing in popularity. The lowering of the lake by means of an irrigation tunnel has spoiled the fishing and most of the best beaches. The large expanse of water is used by flocks of wild fowl as a resting place in hunting season. Due to riparian rules of water frontage, it is practically impossible for the Forest Service to do anything towards improving or preserving the recreational possibilities of this lake.

(4) Gold Run

This stream lies in the Diamond Mountain block on and adjacent to the Plumas Forest. One of the objects of management of this Working Circle is acquisition of cut-over land in this good timber producing area.

Use by picnic parties in the heat of the summer is fairly heavy, and should any desirable recreation land be acquired it should be managed as such.

There are also several small streams along the fault scarp of Diamond Mountain which are at present closed to public use. In the event of acquisition probably some small recreation areas can be developed.

It is estimated that there are 5000 hunters and 1000 fishermen who visit the Eastern Lassen Working Circle annually. In addition there are many more who visit the area for various purposes.

The following policies are in effect, and will be guided by the findings of the recreational survey.

To control recreational use so that timber stands will not be endangered by carelessness or maliciousness.

Thorough contact with hunters and other users in order to make them fire conscious.

Closure of certain extra hazardous areas from all use during the height of fire danger period.

Closure of certain areas to hunting where logging is being done in order to eliminate danger to workmen.

Establishment of a sufficient number of hunter camps to accomodate all users so that promiscuous camping and smoking on fire hazardous areas will be eliminated and game law enforcement will be made more effective. Improvement of about fifty maincamps at water and possibly fifty more secondary camps where smoking and "dry camping" is permitted will be necessary.

(b) Scenic Strips

It is very difficult to anticipate future road developments. Insofar as possible every effort will be made to leave cutting areas in such condition that no serious criticism can be made on the grounds of devastation.

A forester's idea of beauty is a forest of thrifty trees with all decadent individuals removed. It is hard to understand the viewpoint of certain individuals whose idea of beauty is a gnarled old hulk of a tree, half rotten with disease and ready to succumb to an attack of bark beetles.

In following out the instructions regarding scenic strips, it must be remembered that too much shade in snow country makes a road hard to keep open and in repair and that a pleasant prospect is often given by an opening in the timber.

Standard practice along all important roads is to remove only decadent or leaning trees immediately adjacent to the road. Beyond 100 feet an improvement cutting should be made. Beyond 250 feet the standard marking practice should be followed.

3. WILD LIFE MANAGEMENT

(a) Deer

The Eastern Lassen Working Circle is splendid mule deer range. In order to preserve a breeding nucleus of male deer additional refuges should be set aside. Water holes are scarce and in dry years disease is spread through contamination of the congested watering places. Cutting of timber has improved the deer range and building of logging railroads has resulted in considerable water development.

(b) Antelope

The protected herd of antelope has spread from a nucleus at Harvey Valley until they can be seen in almost all parts of the Working Circle. This species requires total protection from hunting in order to maintain itself.

(c) Wild Fowl

(1) Geese

With the first melting of the snow pack in the spring, geese appear on the flats, nesting in old stubs in the adjacent timber or on hummocks in the ponds and reservoirs where they are safe from attack by coyotes, or other predatory animals. By May first the eggs are hatched, and except in dry years the young are well grown and able to take care of themselves by the time the ponds dry up.

In marking timber suitable stubs should be marked and left for nesting places.

(2) Ducks

Ducks nest a little later than geese, hatching about May fifteenth. They like to select hummocks in the ponds where they are safe from molestation during the incubation period. After hatching they remain fairly close to the vicinity of the ponds in foraging. As the ponds dry up the ducks move overland to those that still carry water. This finally results in great concentration in ponds such as Poison Lake, the Feather Lakes and in the reservoirs which usually hold water until late in the season. Building of artificial hummocks in the ponds for nesting places would be of benefit to wild fowl.

4. ROAD DEVELOPMENT

Road development has been somewhat haphazard. Because of the ease of construction, the area as a whole is well served with roads.

A highway is planned to traverse the area from Westwood to the Alturas highway near Pittville. This main highway will stimulate truck logging of the Red River holdings and will tend to reduce the amount of this timber delivered to Susanville mills.

A fairly good lateral road right of way was cleared by Civil Works Administration labor between Hog Flat and the Susanville Highway to complete the Susanville-Pittville Road. Upon completion this will make possible the truck logging of the remainder of the Lassen Lumber & Box Company sale.

It is planned for the remainder of the cutting on the Fruit Growers sale to put in quite an extensive system of roads for fire protection purposes. These will follow skid trails and fire lines. As discussed under fire protection, there are several areas of uncut timber where it is very desirable to construct low standard truck trails in order to speed up travel to fires. For the most part this should be merely clearing of logs, rocks, and small trees with a minimum of grading.

5. FIRE PROTECTION

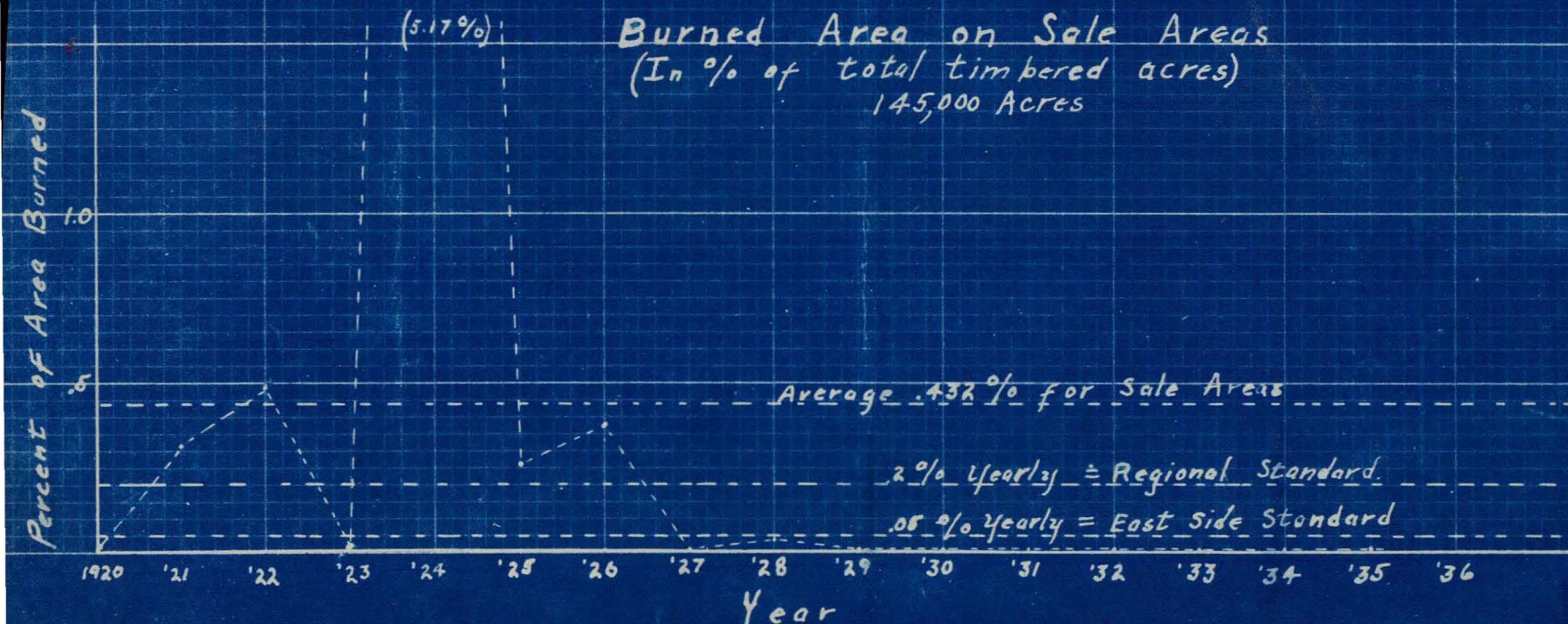
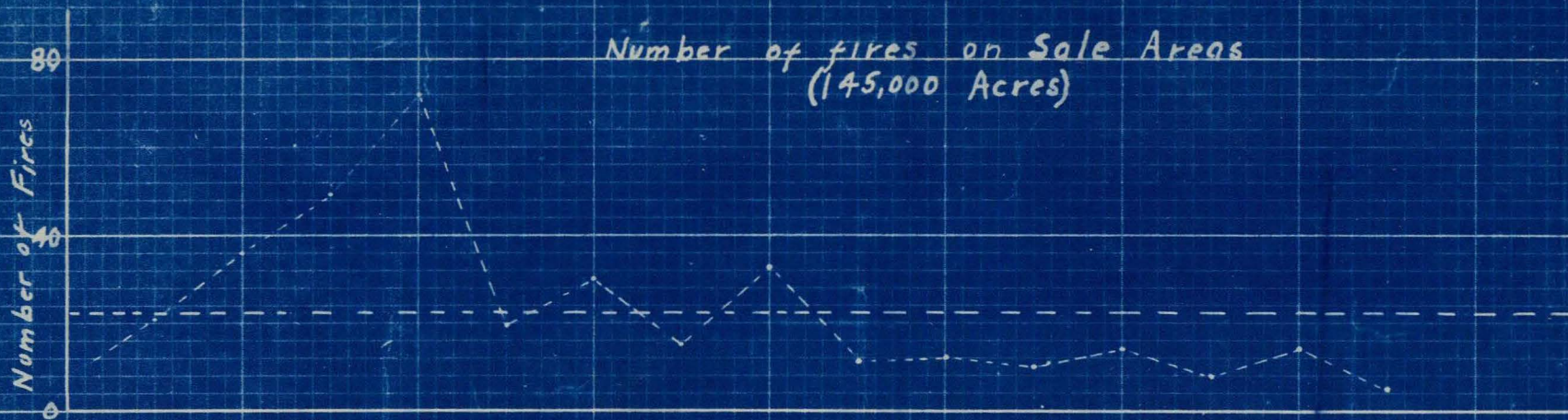
Fire protection in Block A started with very poor results. Fires occurred in 1921, 1922, 1924, and 1925 through lack of air tight organization. Since 1926, with no hazard because of donkey logging and a no smoking rule, very good results have been attained in fire protection.

Fire protection in Block C has always been excellent due probably to low hazard and because donkey logging has never been practiced.

The accompanying graph shows the results of fire protection for the two sale areas. Since 1926 the burned over area has been held to a yearly average of .008% of total timbered area.

(a) Additional Protective Measures Needed

A detection study was made in 1933 which shows the need of additional detection in the Eagle Lake Basin. An additional lookout fireman setup was authorized for Dow Butte but has not been built due to the fact that construction of improvements on the



higher hazard west side types has been given priority.

Areas needing further road development in low standard ways are:

Cone Mountain	Round Valley Buttes
Crater Mountain	Brockman Flat
Campbell Mountain	Cals Mountain
Swain Mountain	Swain's Hole
Patterson Mountain	Roop Mountain
Bogard Buttes	Coyote-Hamilton Peak

(b) Additional Communication Facilities Needed

A quick method of communicating with the woods crews is desirable in order to get quicker action in fire suppression. The messenger system, while giving good results is speeded up fifteen to thirty minutes by the use of several short wave radio sets.

(c) Telephone System

With the completion of the planned lines to Antelope and Dow Butte Lookouts a much better telephone service will be had. Telephone communication from Pegleg Lookout to Lasco Camp would also improve the efficiency of Pegleg Lookout.

(d) Pegleg Lookout

The abandonment of Pegleg Lookout, which is indicated by the detection study, would decrease the effectiveness of the detection system. Dyer Mountain and Red Rock, while covering this area, are not close enough to distinguish the movements of logging equipment and to distinguish as promptly the difference between a dust whirl, jammer smoke, or a slash fire. The retention of this point as a lookout until the completion of logging and slash disposal seems very desirable.

6. BLISTER RUST CONTROL

Several species of ribes are very numerous in the Eastern Lassen Working Circle. No control work has been done because sugar pine is not an important species here.

7. INSECT CONTROL

Data in 1922 indicated an insect loss of fifty board feet per acre, or eight and one-half million feet per year, for the whole of Block A. (Figures on losses for 1933 to 1935 indicate a loss of over 200 board feet per acre for the northern part of the Working Circle and the timber which lies between it and Big Valley.)

Four plots in Pine examined yearly since 1929 give an average loss of ninety-five thousand feet B. M. per section, or 147 feet per acre. This means a loss of twenty-one million board feet per year for the 144,000 acres uncut in the block. The sad aspect of the insect attack is that although balanced in the long run by growth, the loss is in high quality material while most of the growth is in low quality material.

Insect loss in white fir is beyond control on the lower sites. Because of this heavy loss, clear cutting of white fir is indicated. Having a negative commercial value it is necessary to mark light on all sites, and the loss is "just too bad." Some areas, particularly the north side of Ashurst Mountain, show such a heavy loss in white fir that a snag disposal project is necessary on the cut over land.

Insect control work in ponderosa and Jeffrey Pine has been done in and adjacent to this block. Winter control was done during the 1933-34 and 1934-35 seasons. Control by means of salvage logging was tried out on the Fruit Growers Supply Company sale during the 1935 logging season. Five and one-half million feet of insect attacked timber was taken out. Results both from costs and effective control standpoints were very encouraging.

An insect salvage clause was embodied in the 1936 revision of the Fruit Growers Supply Company Sale Contract which requires the logging of not to exceed five million feet of insect attacked ponderosa and Jeffrey Pine in any three year period, lying not more than 6,000 feet from any railroad or constructed road, if an infestation becomes serious.

Insect loss can be correlated directly with cycles in precipitation in the Eastern Lassen Working Circle.

8. RODENT AND PREDATORY ANIMAL CONTROL

The Fish and Game Commission and the Biological Survey have done considerable control work on coyotes, porcupines and ground squirrels

(a) Ground Squirrels

Ground squirrels destroy an enormous amount of forage. Control work accomplished by poisoning to be effective must be carried on each year because of the rapid breeding of the species.

(b) Coyotes

These animals prey on breeding ducks and geese, bands of sheep and on fawns of deer and antelope. A predatory animal trapper is usually stationed at Halls Flat and constant work is necessary

in order to keep the number of coyotes at a minimum.

(c) Porcupines

Porcupines deform large numbers of trees. Control work by poisoning and shooting was carried on in 1933 and 1934 and the numbers were greatly reduced. Periodic control work will have to be done to keep this species at a minimum.

(d) Gophers

Gophers do some damage to reproduction by eating off the bark in winter under the snow. This is very apparent just after the snow has melted in the spring. The rodents tunnel through the snow from tree to tree and often fill up this snow gallery with dirt. After the snow melts these earthen cores are very noticeable, leading from one barked tree to another.

Further study is necessary to determine species and methods of control and whether this damage is important enough from a silvicultural standpoint to warrant control measures.

9. PLANTING

The tree nursery at Susanville has an annual capacity of over one million trees. The output is allocated to four east side forests.

Due to deficient precipitation and competition of planted stock with already established brush species, success has been only fair in planting up burns. A fairly satisfactory stand has been secured on approximately 1,500 acres of the better site of the Antelope Burn.

Brush has become so thick on the Antelope Burn that further planting is not practicable. Brushfield stripping has been done on the better sites and when this is satisfactorily stocked, no further planting will be done. In the event of further burns, planting will be done promptly before brush gains a foothold.

Planting on the private land has been partially successful. The Fruit Growers Supply Company has also completed planting on practicable sites.

10. STAND IMPROVEMENT

In 1933 and 1934 stand improvement projects were pursued on timber sale cut-over areas. This consisted of thinning and release.

Type: Pure P. P. - J. P.	Acres: 2,230
Mixed P.P. - W. F.	<u>1,296</u>
	Total: 3,526

No further work will be done except on an experimental basis. Should acquisition of private cut-over lands be accomplished, an attempt will be made to secure appropriations or CCC camp allocations in order to fall snags and diseased trees.

11. EXPERIMENTAL FORESTS

Two experimental areas have been set up within the Working Circle, the timber from which is figured in the management plan to supply the Fruit Growers plant.

Swain Mountain, in Township 39 North, Range 8 East, M. D. M., is an area of 6,080 acres containing the following stand:

Western Yellow Pine	2,618	M feet	B. M.
Sugar Pine	1,066	"	" " "
White Fir	58,549	"	" " "
Red Fir	67,079	"	" " "
Incense Cedar	300	"	" " "
Lodgepole Pine	1,823	"	" " "
Total	131,435	"	" " "

This timber is unmerchantable at present due to the high percentage of inferior species, though it is of excellent quality. It is included in the tabulation of fir areas. Swain Mountain Experimental Forest with some adjacent land has a total stand of 177,000 M. B. M.

Since utilization of this timber is far in the future, no plans can be made regarding its place in the management plan.

The Blacks Mountain Experimental Forest in Township 33 North, Range 7 and 8 East, M. D. M., is an area of 10,252 acres, consisting of the following types:

Ponderosa Pine	5,972	Acres
Ponderosa Pine-White Fir	2,200	"
Scattered Timber, Site V	1,000	"
Sagebrush and Grass	1,080	"
Total	10,252	"

Timber Estimates:

Ponderosa Pine	153,000	M. feet	B. M.
White Fir	13,000	"	" " "
Incense Cedar	4,000	"	" " "
Total	170,000	"	" " "

This area lies in the block reserved for Fruit Growers Supply Company operations and represents five years cut for that plant, or an average of over two and one-half million feet per year for the fifty-five years remaining in the cutting cycle. There are many objections and difficulties presented to the orderly cutting of the Block A because of the fact that the Experiment Station may wish to do some cutting before the Fruit Growers have extended their transportation system and are in a position to accept the logs. The management plan calculations are liable to be upset by this unknown factor.

Justification for this project will lie in the satisfactory solution of vitally important problems in silvicultural management for this type and site.

12. GRAZING

There is no doubt but that grazing under certain conditions is inimical to the best silvicultural practice. Considerable time has been spent in close observation of grazing on cut-over areas, particularly the Logan Mountain fire line area. Feed on this area has increased at least 500% since logging.

(a) Cattle

On the Pine Creek Range, which is not over grazed, cattle stick to the meadows until late in the season when the meadow feed is dried up. They then begin to work into the timber. Late in the season examination showed that there was no spot of unobstructed ground that had not been trodden upon by an animal for a strip one-fourth to one-half mile into the timber.

(b) Sheep

Although sheep grazing has been prohibited on cut-over land, a band of sheep was put on the Logan Mountain Unit in an attempt to reduce the amount of herbaceous vegetation on the fire lines. Herbaceous plants are: Sunflower (*Balsamorhiza* and *Wyethia*), Bunch Grasses (*Poa* Sp. and *Festuca* Sp.), Squirrel-tail Grasses (*Hordeum* Sp. and *Sitanion* Sp.) annual grasses (several species), mint, butterweed (*Senecio* Sp.), penstemon and others.

Brush species are squawmat, snowbrush (*ceanothus velutinus*) manzanita, snowberry (*Symphoricarpos*), bitterbrush (*Purshia Tridetata*), yellow brush (*Chrysothamus* Sp.).

The principal fire hazard is from grasses, sunflowers and snow-brush.

Best results have been attained by starting to feed the fire lines as soon as the quick maturing annual grasses and squirrel tail grasses show any considerable growth. Sheep, at this time, eat the succulent grass blades very well and the bulk of feed is gotten from species which later are not palatable. This early cropping results in a regrowth of succulent leaves and prolongs the period of use of these species. Sunflower is well up and flowering but only Balsamorhiza is eaten freely at this time.

As the season advances more use is made of the bunch grasses and browse. By July 1 Snowbrush, Shoestring and Bitterbrush are sprouting and the succulent shoots are eaten. Squawmat is not eaten to any extent.

Sheep are handled by the "Burro System" and are herded loosely along the fire lines, filtering out to the sides to some extent. They are bedded at line intersections. Superficial examination seldom discloses any damage to coniferous reproduction from this method of loose herding and leisurely feeding. No good seed and germination years have occurred since cutting. Reserve range is available so that when a good combination of seed year and germination occurs, the sheep may be removed from the area without hardship to the owner.

Approximately one third of the cut-over area is not stocked and it is important in order to establish a normal succession of age classes that the non-stocked areas be seeded successfully within ten years after cutting.

It seems apparent that with proper handling, sheep and cattle are very beneficial to the cut-over lands in trampling and breaking up the slash and in removing a very appreciable amount of vegetation which would otherwise constitute a serious fire hazard late in the season.

The unit studied is stocked conservatively on the cattle range and only about one-third stocked with sheep on the sheep range. It would be desirable from a fire protection standpoint to stock the sheep range more heavily so that more of the area not covered by fire lines could be fed off. However, the necessity for care in selection of a man who will follow instructions in handling sheep, observe the strictest care with fire, and who has available range in case it were desirable to exclude sheep, limits the field of choice. The large deer herd on this unit is also to be provided for, so that probably one band feeding the fire lines is all the prudence will allow.

After a fully stocked stand of reproduction is secured on cut-over areas, sheep grazing is entirely beneficial if handled properly. Cattle continue to damage young trees to some extent by rubbing against them in an attempt to brush off insects and in so doing break off branches and leaders.

13. WATERSHED AND SOIL CONSERVATION

The Eastern Lassen Working Circle lies almost entirely in the high lava plateau of northeastern California. With the exception of the Diamond Mountain Range and adjacent spurs, which are granitic in origin and slope steeply into Honey Lake Valley, the whole of the area remains practically as laid down by flows of lava and volcanic mud and showers of pumice and ash. The effect of water in dissecting the formation is noticeable only to a small extent.

Sheet erosion from wind and water has taken place in ages past as shown by the "float rock" areas noticeable in some places. On some of the flats dune formations show that wind has been instrumental in moving the light soil. Gullying of meadows has taken place in some instances where over-grazing has broken the sod during the recent dry precipitation cycle. The seasons 1935 and 1936 have been marked by a return to normal and with a decreased number of permitted stock carried from the dry years, the flats are showing marked betterment.

The old stock driveway following the old emigrant trail from Westwood north to Norvell Flat and on out through Pine Creek to the north of Eagle Lake, and the vicinity of shipping points such as Westwood Junction and Norvell Flat gives more examples of overgrazed conditions than any other part of the Working Circle under Government control. A good many bands have been diverted from the driveway route in an endeavor to remedy the situation. A range revegetation enclosure has been built at Norvell Flat where the cover had been completely destroyed.

Within timbered areas overgrazing has not resulted in loss of soil to any noticeable extent since the forest litter and open porous soil prevent such surface water runoff, and the effect of the trees in breaking the wind prevents blowing of soil.

The Antelope fires resulted in a vast amount of soil deterioration on the steeper slopes of the burned area. Soil that had been built up for centuries from decayed vegetation being mixed with the scant mineral soil was burnt out. Winter rains washed this scant remnant of mineral soil away and now one wonders how trees ever grew in such a rock pile.

In the Willard Creek and China Creek Chances and on Diamond Mountain, erosion is something to be dealt with very carefully. Steep slopes and a different character of soil make any disturbance of Nature's balance dangerous. Willard Chance is Government owned and the timber is reserved for future sales to the Lassen Lumber and Box Co. The Forest Service system of selective logging and careful disposal of slash will fully protect the soil against deterioration. On lands not owned by the United States which have been logged since the establishment of the mills, broadcast slash burning has been done to a large extent. This practice results in soil deterioration of more or less

serious nature. Spot or strip burning can be done in such a manner as to make possible the control of fires and yet not rob the soil of enough protective cover to start serious erosion. Ignorance, bullheadedness and the pressure to keep costs down have resulted in the sacrifice of considerable values.

To summarize the situation:

(1) On the National Forest, soil deterioration has taken place on burns and on overgrazed areas. This is localized, has been recognized, and preventive and corrective measures have been taken.

(2) On privately owned lands, soil deterioration is the rule following logging, where fire has been allowed to run in the slash. A good deal of erosion has occurred as the result of overgrazing, poor salt distribution, etc.

Preventive and corrective measures are hard to apply. When the range is controlled by the Government, the number of stock permitted can be cut until a satisfactory balance is attained. The timber owners in the fire protection boundary have been encouraged in conservative logging and slash disposal.

Acquisition through N. F. R. C. purchase and land exchange is indicated as a solution to the problem. It is necessary that the bulk of timber growing land in the Working Circle be controlled by the Forest Service and put under management in order to again attain maximum productivity.

14. WATERSHED CONSERVATION

Watershed and soil conservation are so closely inter-linked that it is hard to talk of one as separate from the other.

The watersheds of the Eastern Lassen Working Circle are depended upon for all of the irrigation water used in the Honey Lake Basin.

The Susan River irrigation system was started in early emigrant days and gradually enlarged by the building of McCoy, Hog Flat, and Leavitt Reservoirs, which were built to store the flood waters for use in summer. There are 8,000 acres under irrigation.

The Tule-Baxter Irrigation System was promoted during the World War by private means after having been rejected as impractical by the Reclamation Service. Eagle Lake was tapped by a

long tunnel and the water level has been lowered until the taking of further water is only done at prohibitive expense. The project rated at 25,000 acres has fallen far short, so that less than 5,000 acres are irrigated successfully.

Numerous minor systems irrigate 20,000 acres additional in periods of normal precipitation.

15. WATER POWER

Water power needs of this Working Circle are served by development on Hat Creek and can easily be supplemented from the Feather River System. This is adequate to take care of future needs. The water power possibilities of Susan River are too small and uncertain to be economically feasible.

A P P E N D I X

I. REGION FIVE MARKING RULES SUMMARY

Regulatory cutting will be governed by the Region Five marking regulations, which are given below. (See circular "S-Sales-Marking" of March 30, 1928, 91-S-16)

"The practical application of these tree classes in sales marking work may be stated as follows:

Class 1. (Thrifty-dominant) trees are superior to all others for the reserve stand, for all diameters, and especially so in the smaller sizes. They are making the best rate of growth, have the lowest loss liability factor, are least susceptible to insect^{or} fungus attacks, and are good seed bearers when of sufficient size. The present market value of such trees is comparatively low. Class 1 trees should always be retained when sound.

Class 2. (Thrifty co-dominant) trees are slower growing than those in Class 1: they make a fair growth but are more liable to loss and are poor seed bearers. They are usually the codominant trees in typical "black jack" clumps, and should be cut in preference to class 1 trees, when making thinnings in such clumps.

Class 3. (Mature-dominant) trees are the thriftier trees in the mature class and are still making a fair growth as a rule. Wood production is usually quality material upon the lower portion of the tree. They are good seed bearers and their loss liability is usually low. They are desirable for retention as seed trees, or to constitute a moderate reserve of high quality material for value increment, and to make a second cutting feasible in a reasonably short time.

Classes 4 (mature co-dominant) and 5 (over-mature-dominant) produce very little growth even on the best sites. Their liability to loss is very high. Class 4 trees are especially subject to insect attack and have practically no chance of survival once they are attacked. They are generally good seed bearers, but the retention of trees in these two classes involves the risk of a large investment in high quality material. They should practically always be cut except when needed to fill an opening.

Class 6 (thrifty-intermediate) trees grow fairly well and give promise of later development if released. They bear practically no seed. They should be retained, as a rule, because of their low market value, low risk and the promise of a fair growth if released.

Class 7 (over-mature suppressed) trees are undesirable from any standpoint, and should be cut whenever possible. They are mature and over-mature intermediate or suppressed trees, with scraggly deformed crowns. At best they are slow in responding to release and rarely attain a profitable growth rate.

The above may be briefly expressed in large part as follows:

1. Classes 1, 2 and 6 should be left and classes 4, 5 and 7 should be marked in practically all cases, with the exception that in thinning black-jack clumps some of the trees in Classes 2 and 6 may be cut.
2. Trees in class 3 are usually good risk trees, are making a fair growth (about 0.7% to 1.2% per annum), are making a high value increment, are good seed bearers, and as a rule a goodly number of them are necessary from the standpoint of leaving an adequate reserve stand for a return in a reasonably short time and for seeding purposes. The best trees in this class should be left.
3. Trees in Classes 4 and 5 should usually be cut because of slow growth, high value, and high risk from insects, fungi, and old age. Trees of Class 5 are good seed bearers usually, and sometimes it is desirable to leave a limited number on poorly reproduced areas where none of Classes 1 or 3 are available.

Marking Rules.

For convenience, pending the issuing of revised notebook marking rules, those portions of the former rules of January 14, 1924 which have not been changed materially by the adoption of the above described tree classification are repeated here with slight revision which has been indicated by underlining.

Object of Marking

1. To harvest ripe timber, diseased timber and timber most susceptible to insect attack.
2. To insure the possibility of a second cut within 40-70 years wherever practicable.
3. To secure reproduction following cutting.
4. To accelerate the growth of the existing reproduction and trees to be left on the area.
5. To make the timber purchaser's operation as profitable as the practice of good silviculture will allow.

In each specific case, it is necessary for the marker to have a clear conception of the principal objects and of their relative importance. His aim should then be to accomplish these objectives.

Rules

The following abbreviated rules contain the "meat" of marking practice:

1. No greater volume of timber should be marked than is specified in the contract except for silvicultural reasons, such as decadence, disease and insect infestation or well established susceptibility to such infestation. A sample marking must be made and recorded by tree classes, on each advertised sale every thirty days during the operating season. Each marking should embrace at least $2\frac{1}{2}$ acres on all sales where the cut of National Forest timber is 3 million feet B.M. a year or less and at least 5 acres on all larger sales. (See S-Sales-Marking circular July 12, 1927, 6-S-1, for more detailed instructions on this point.)
2. Recognize two site classes, viz: good and poor. (Consider a good site one on which the tallest 10 percent of the trees contain 8, or more, 16 foot logs, and a poor site one on which the tallest 10 percent of the trees contain less than 8 logs). In actual practice under average conditions good marking has generally resulted in leaving a reserve as a basis for a second cut of about 4 M. to 10 M. per acre on good sites, and about 2 M. to 5 M. per acre on poor sites.
3. Bearing in mind the necessity for leaving ample reserve for the next cut, mark so as to release well established advance growth, poles and thrifty trees from light and root competition to the largest practicable extent.
4. Maximum opening should not exceed 2 acres.
5. Mark all decadent trees.
6. Mark all class 4, 5, and 7 trees, except those class 4 and 5 trees badly needed for seed, scenic beauty at camp grounds and along roads, or to make up a necessary reserve required by an approved management plan, and those class 7 trees which are unmerchantable under the terms of the timber sale agreement.

7. When a choice of species is necessary favor the pines, particularly sugar pine in its optimum range (except as modified by rule 8).
8. In stands containing approximately 20% or more of the true firs, for economic reasons it is now our policy to calculate stumpage prices in the appraisal on the basis of leaving (a) all fir 16 inches and under at D.B.H. and (b) all fir up to about 30 inches D.B.H. which is full crowned and has no external indications of serious injury or defect. Special appraisal recommendations and special conditions should govern the fir marking in such stands.
9. Remove the least desirable individuals in crowded groups composed of tree classes 1, 2, and 6 except where injury is certain to result because of donkey logging, or where past experience has indicated that such action causes unusual windthrow.
10. All dead trees 20 feet or over in height should be marked for cutting and should preferably be felled with the green timber to secure full utilization. At least all trees considered merchantable by the marker should be so felled.
11. All badly diseased and green insect infested trees should be marked regardless of merchantability (unless in very special cases the contract provides otherwise.)
12. All trees with bole, or heavy limb mistletoe infection, whether apparently thrifty or not, should be marked if they contain one merchantable log.
13. Mark lightly, making an improvement cutting only, along main roads and spots frequented by the public (special marking rules for each case desirable.)
14. Unusually tall trees and trees with very large crowns in situations exposed to severe winds should be marked. Leaning pine trees severely fire scarred are poor wind risks and should be marked."

II. PRECIPITATION CHART (Figure 2)

This chart is made up from all the available precipitation records for Susanville and Westwood, Lassen County, California.

The precipitation trend is drawn in ~~for~~ Susanville for the period 1889 to 1935.

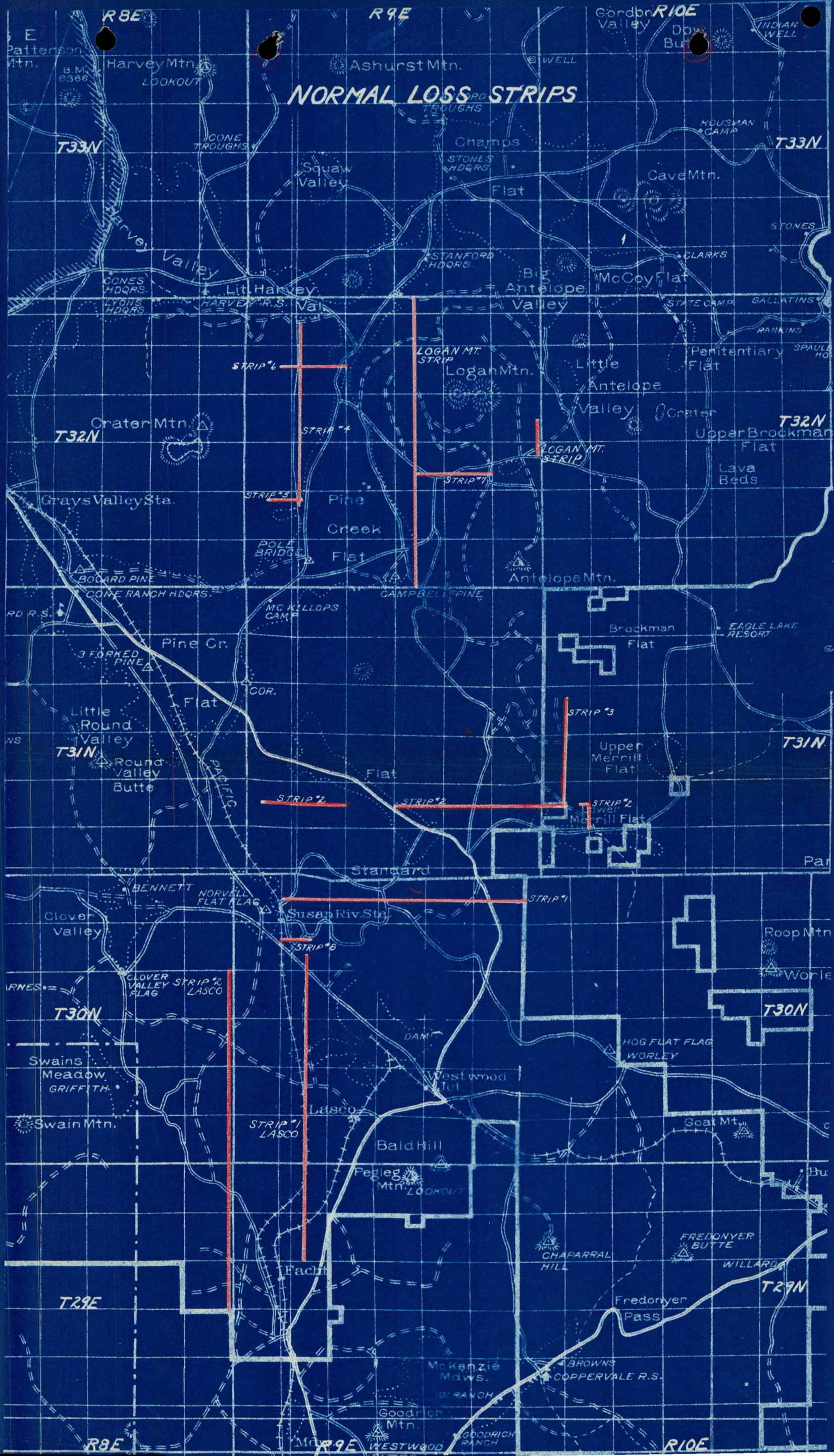
III. DIAGRAM OF NORMAL LOSS STRIPS

This diagram shows the approximate location of the permanent Normal Loss Sample Strips in the Eastern Lassen Working Circle.

These sample strips are monumented along the center line at 5 chain intervals. A tally of all trees 4 inches D.B.H. and over is made by height, diameter, species and thrift class. Dead trees are marked with an axe and tallied as to height, diameter, species and thrift class, and also cause of death. All trees are tallied for a distance of one chain on each side of center line of strip.

Every 10 chains a reproduction sample plot is laid out and mapped by symbol for the dominant tree in each mil-acre plot. Skid roads, barren areas and areas shaded by older trees are mapped.

Each 5 years a re-examination of the strips and plots is made and the loss determined.



IV. AREA DISTRIBUTION OF AGE CLASSES (Figures 11 a, b and c.)

This graph shows the distribution of age classes by three general types, and shows the degree in which the present stand will approach normality. at maturity.

Lasco - Ponderosa - Jeffrey Pine Type.
Logan - Ponderosa Pine-White Fir Type.
Fruit Growers Supply Company Cuttings -
Ponderosa-White Fir Type.

(Fig 11 c) These differ from the Government cuttings in ponderosa pine-white fir type chiefly in that there is a stand of decadent white fir which suppresses a part of the thrifty growth. The 12% total area occupied by trees over 60 years old is placed lower in the graph scale than the corresponding 7 and 8% in Government cuttings, because the Government marking results in leaving a younger tree. The average maximum age of trees on Government cut-over is possibly 150 years while that on F.G.S. Co., cuttings is possibly 200 years.

Age classes were tallied by very general divisions indexed roughly by size.

0 - 10 years old	-	0 to 6 feet high
10 - 20	"	" - 6' high to 3.5" D.B.H.
20 - 60	"	" - 3.6" D.B.H. to 11.5" D.B.H.
60 plus	"	" - 11.6" D.B.H. and over

All areas were tallied as stocked if there was at least one healthy individual for each five mil-acres of area. This corresponds to 200 trees per acre or a spacing of about 15 feet. All stocking is on the basis of the dominant tree in the space.

FIG. 2 - PRECIPITATION CHART

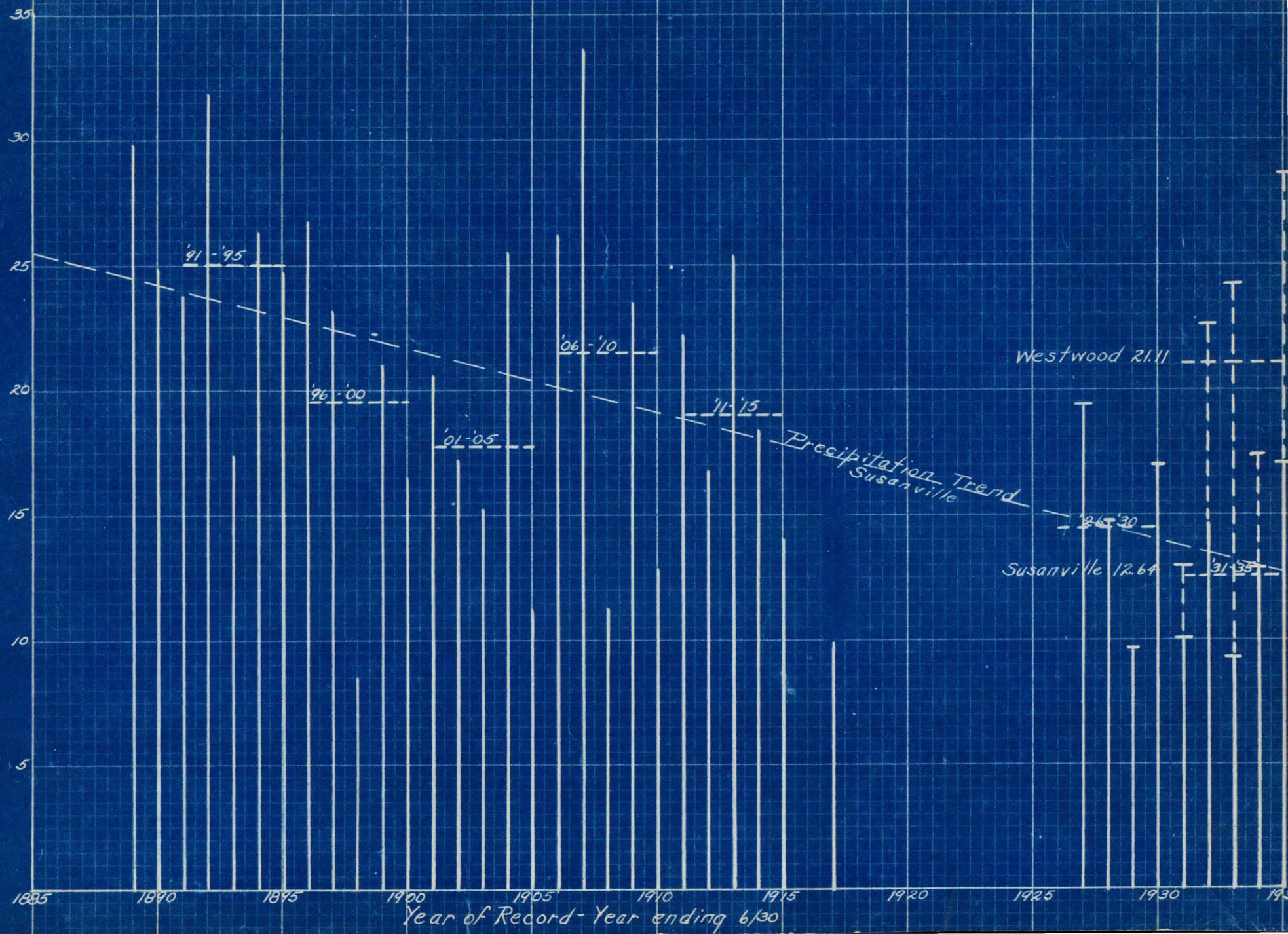
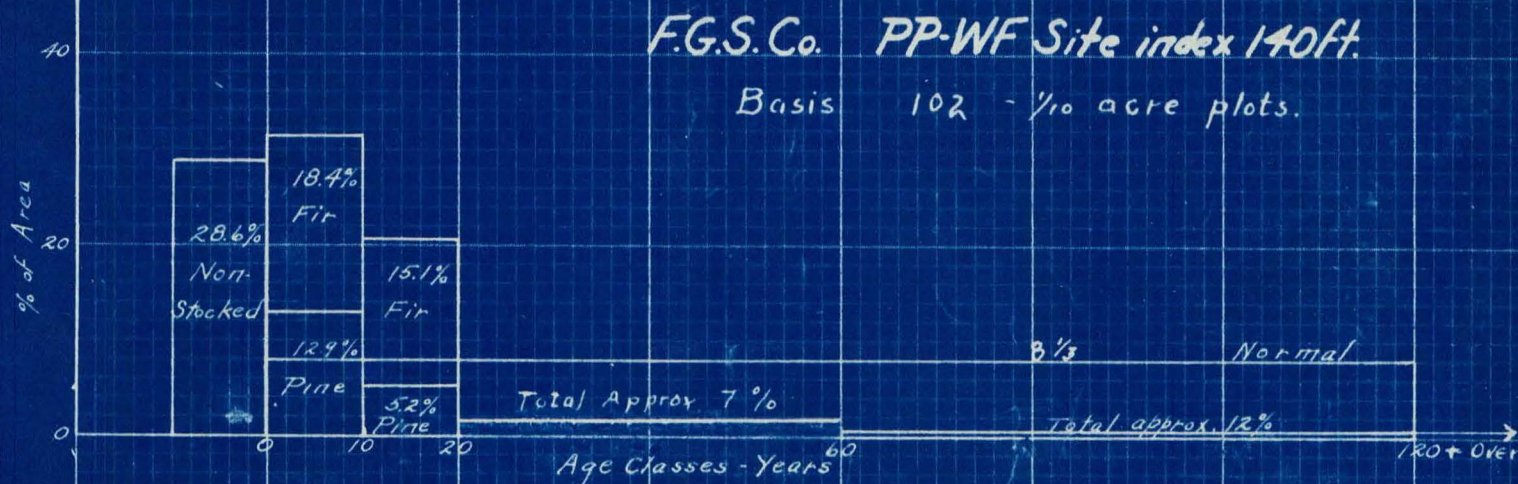
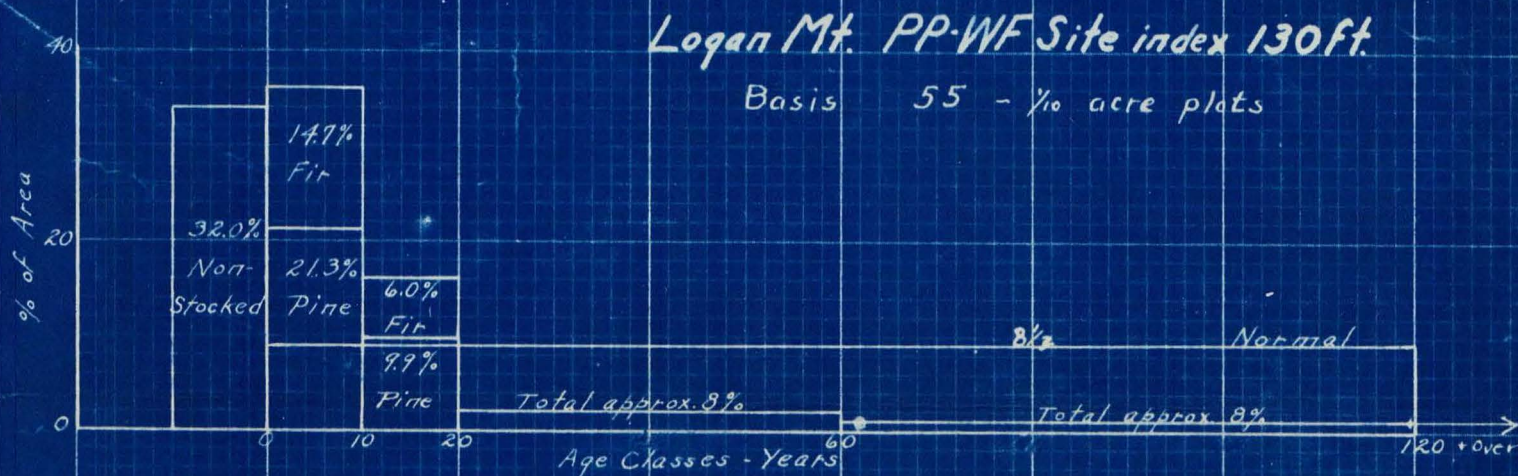
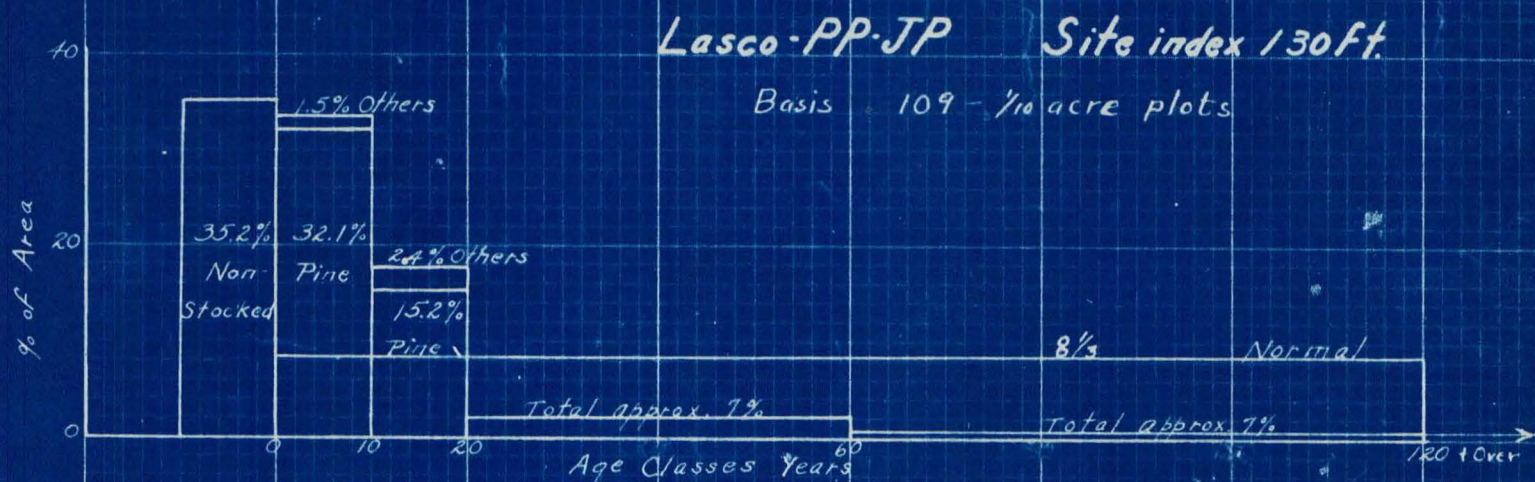


FIG. 11 a,b,c

EASTERN LASSEN WORKING CIRCLE AREA DISTRIBUTION OF AGE CLASSES

$8\frac{1}{3}\%$ of area for each 10 year age class
constitutes normality.



V. GROWING STOCK DIAGRAMS (Figures 12 a, b and c.)

The purpose of these graphs is to give a picture of the present stand and the expected growth and losses of the average cut-over acre on three different types. Figure 12-a is the average for the Government cuttings at Lasco, about 18,000 acres. Figure 12-b is the average acre on Government land in the Fruit Growers Sale, about 25,000 acres. Figure 12-c is the average acre on Fruit Growers private cuttings, about 17,000 acres.

In explanation of the graphs, taking 12-c as an example, the top graph illustrates the growing stock of white fir. The vertical scale is in feet B. M., the horizontal scale in years, beginning in 1920 when the first cutting was done.

The original stand of 13,000 board feet per acre is very defective and under present utilization standards, a cruise of 50% of this figure is carried on the company books. On areas where fir was cut there is a leave of 2000 board feet per acre in thrifty sound timber. On areas not cut there is a leave of 3,500 board feet of thrifty sound material. The average is 2,770 board feet, and this figure is used as an average in computing loss and growth.

At the year 1950 a column illustrates that part of the white fir stand which is decadent and partially defective. No increment is figured on this and it should be removed as soon as economic conditions permit in order to make room for thrifty growing stock.

Tentative loss in the white fir left averaged 2% a year for the first $8\frac{1}{2}$ years following cutting. This is obviously too high for the entire cutting cycle. Therefore, the loss figures shown on this graph are not taken from the private cut-over sample but from a tabulation of losses on adjacent Government cuttings, which have been under observation for longer periods. No attempt was made to integrate the sum of all the annual losses in a mathematically correct manner. The rough tentative figure of 80% and 30% was arrived at in the following manner. Average annual loss was multiplied by the number of years in the cutting cycle. ($1.15\% \times 70 = 80.5\%$) and for pine ($.4\% \times 70 = 28.0\%$.)

Average growing stock is present volume plus end volume divided by 2. For example, in graph #12-c, white fir loss is roughly $\frac{2700 + 10,800 \times 80\%}{2} = 5,400$.

The predicted yield from the 0-20 year age classes is taken from tables in Show's Bulletin #407, International Rule, 8" D.B.H. and over, 4" top.

The bottom graph 12-c illustrates the growing stock of pine on an average cut-over acre on Fruit Growers land. The scanty reserve stand in ponderosa pine is partially due to the nature of the original stand which was mainly high quality decadent and overmature trees with very little in the younger age classes.

FIG. 12a
GROWING STOCK DIAGRAM
LASCO PP-JP TYPE

(Approximately 18,000 Acres)

Basis { 10% cruise
202.5 strip-acres Normal Loss sample
109 - 1/10 Acre reproduction plots

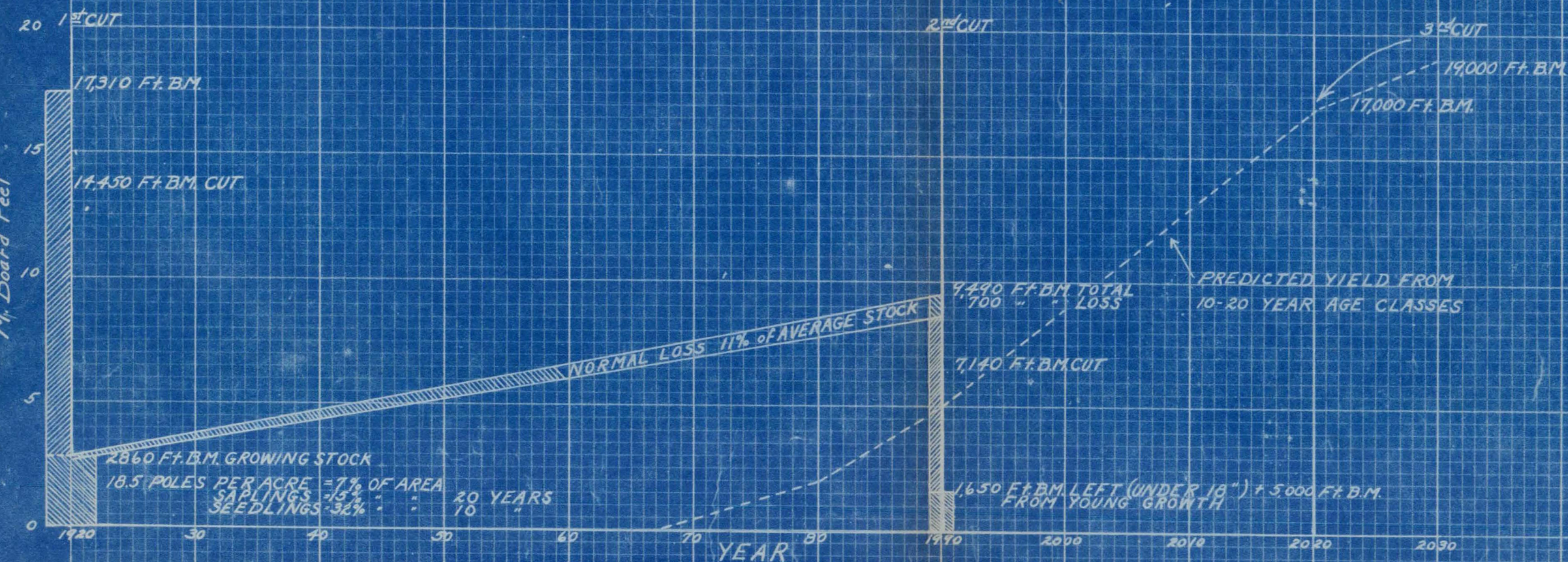
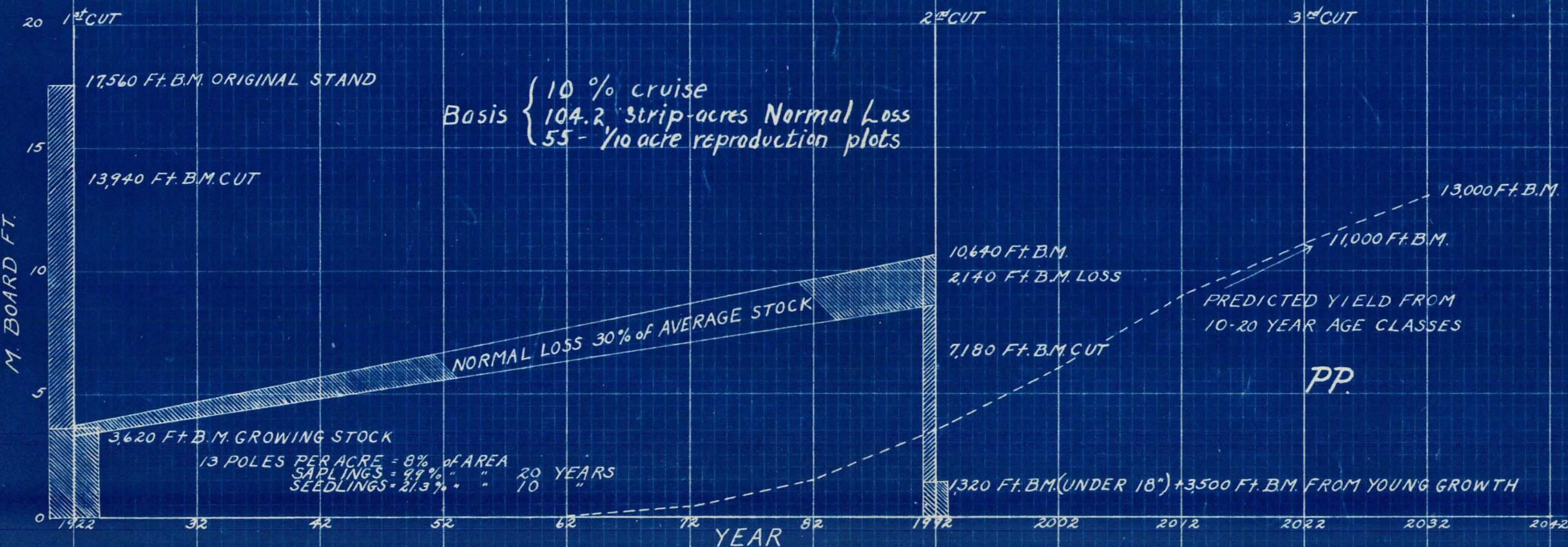
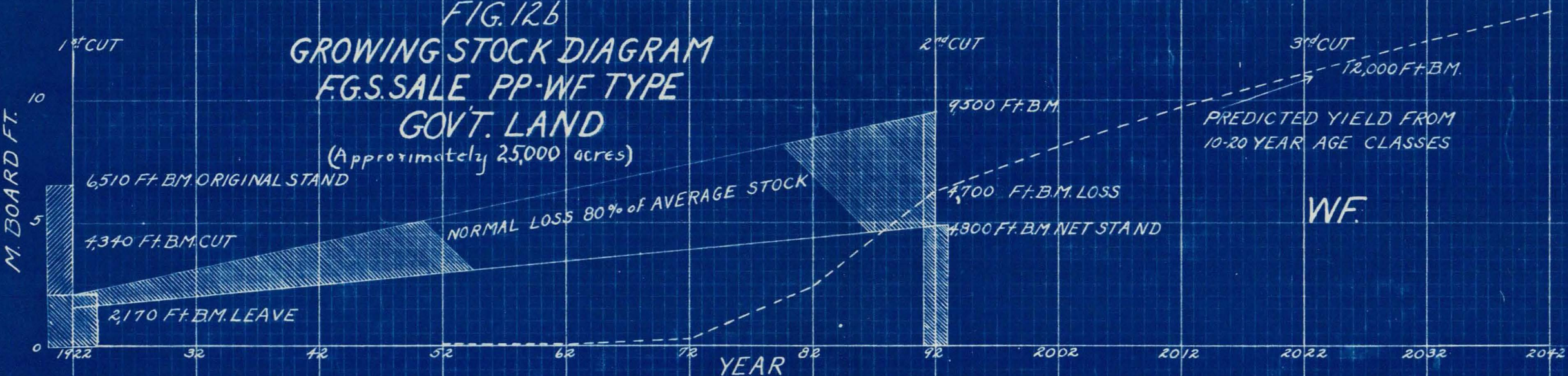


FIG. 126
GROWING STOCK DIAGRAM
F.G.S. SALE PP-WF TYPE
GOV'T. LAND

(Approximately 25,000 acres)

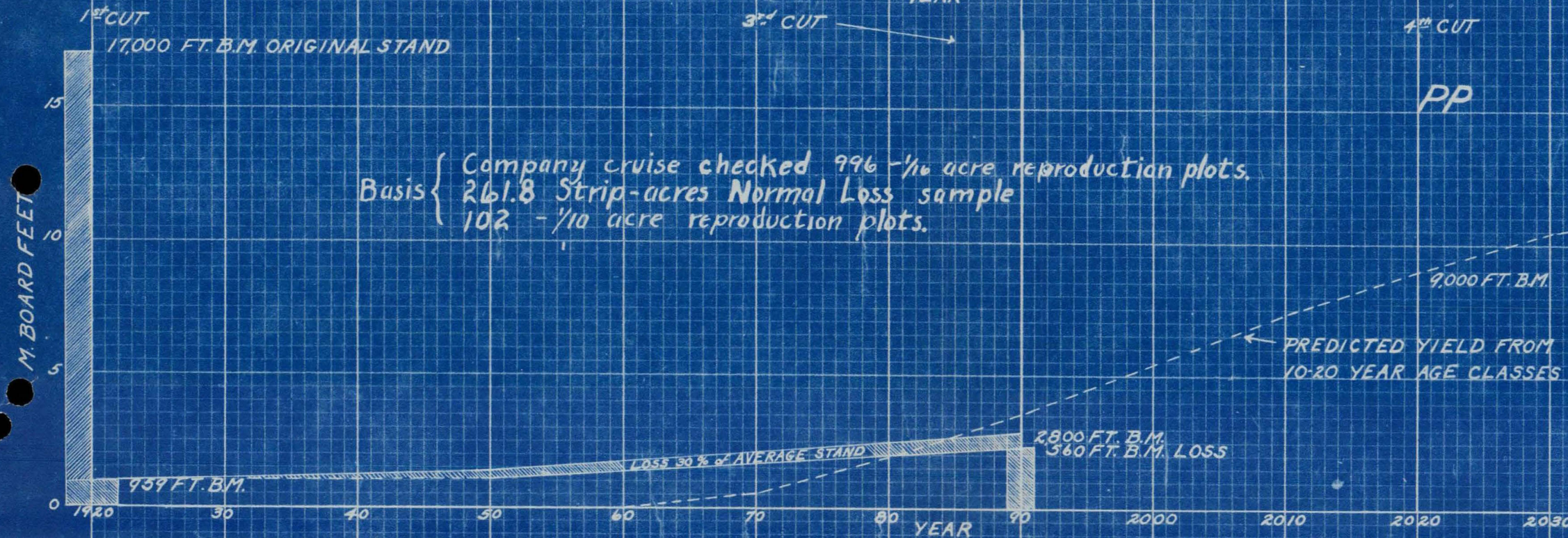


Basis { 10 % cruise
104.2 strip-acres Normal Loss
55 - 1/10 acre reproduction plots

FIG. 12d
GROWING STOCK DIAGRAM
F.G.S. LAND PP-WF TYPE
(Approximately 17000 acres)



Basis { Company cruise checked 996 $\frac{1}{16}$ acre reproduction plots.
261.8 Strip-acres Normal Loss sample
102 $\frac{1}{10}$ acre reproduction plots.



VI. YIELD CAPACITIES OF EAST-SIDE PONDEROSA PINE TYPE

Yield Capacities of Pure Yellow Pine Type on the East Slope of the Sierra Nevada Mountains of California. By S. B. Show.

Figure 13 is traced from the above bulletin. 13-a shows periodic annual increment per acre in board feet (Clark Rule) for second growth ponderosa pine. 13-b shows yields of white fir second growth. Figure 14 is likewise traced from the above bulletin.

14-a shows yields per acre on age for ponderosa pine second growth.

14-b shows the mean annual increment per acre and illustrates the culmination of mean annual increment at 120 years.

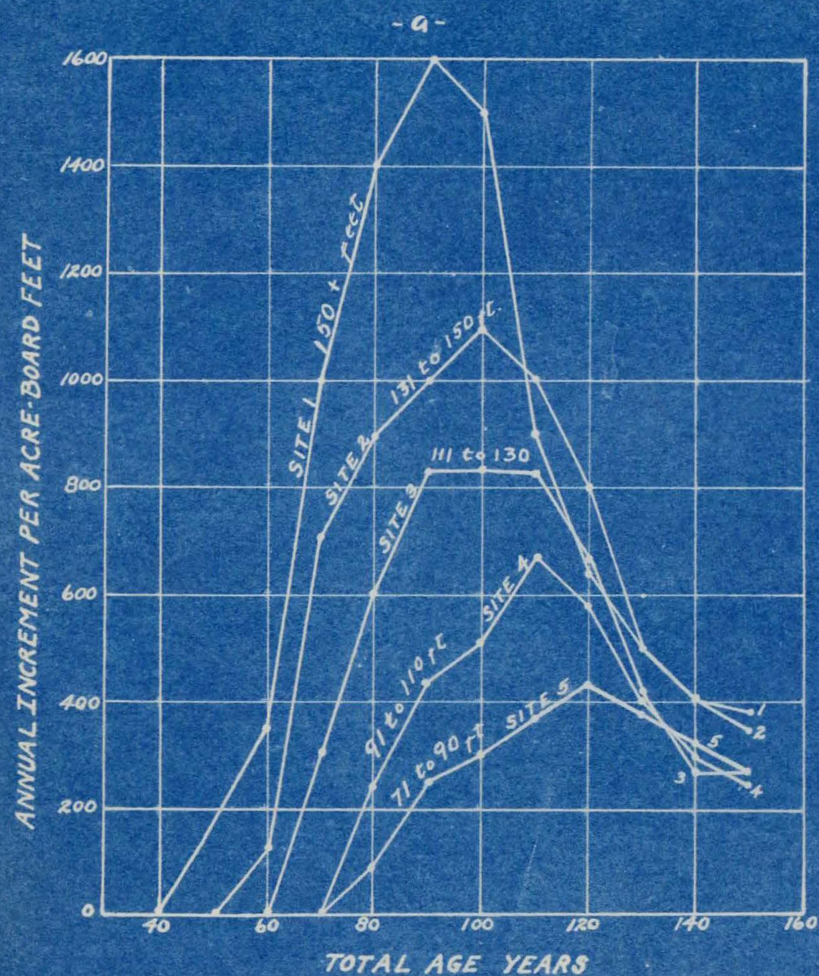
14-c shows the number of trees per acre for fully stocked stands of second growth at various ages.

YIELD CAPACITIES OF THE PURE YELLOW PINE TYPE ON THE EAST SLOPE OF THE SIERRA NEVADA MOUNTAINS OF CALIFORNIA

BY

S. B. SHOW

PERIODIC ANNUAL INCREMENT PER ACRE
BOARD FEET



YIELDS PER ACRE IN WHITE FIR TYPE

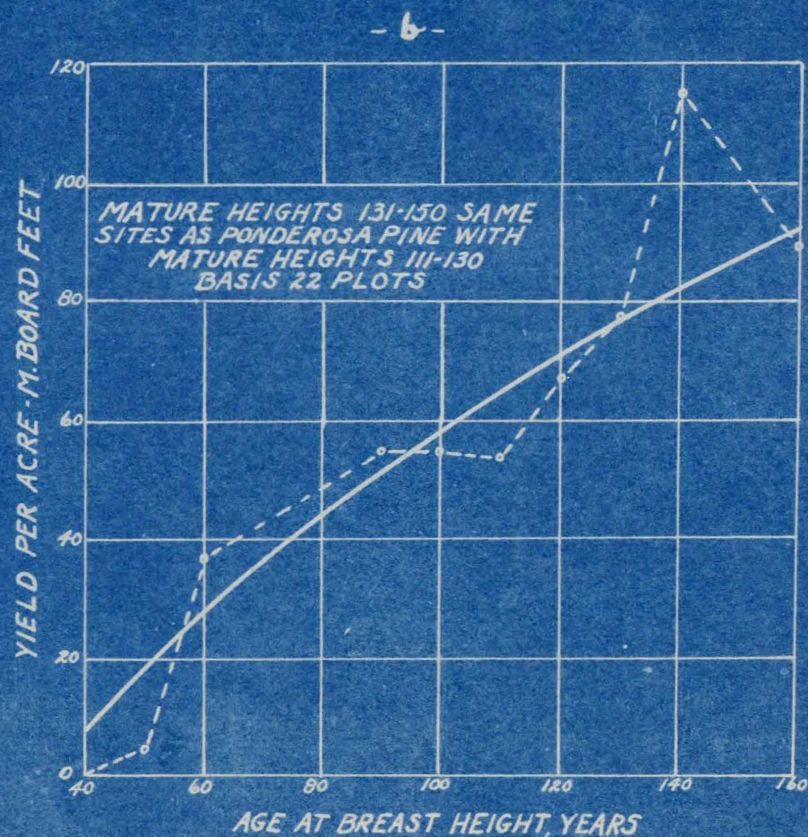
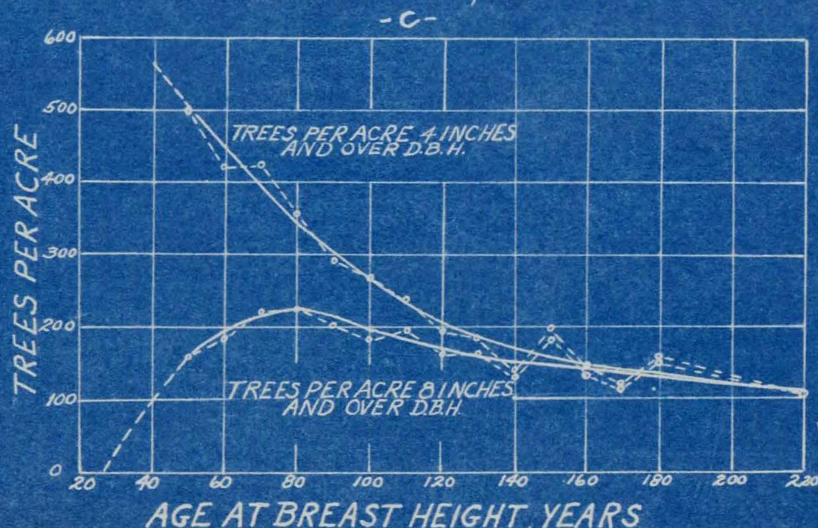
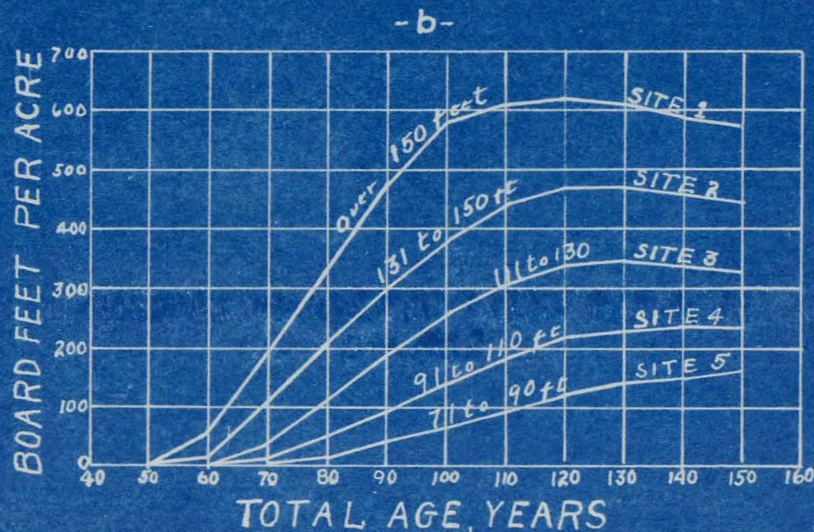


FIG. 14 a, b, c.

S.B. SHOW

- A -

SITE	1	DOMINANTS	HEIGHT	OVER	150 FEET
"	2	"	"	131	150 "
"	3	"	"	111	130 "
"	4	"	"	91	110 "
"	5	"	"	71	90 "



VII. TIMBER SUPPLY DIAGRAM

The Timber Supply Diagram #15 gives a picture of the whole plan of yield. The lower graph shows the yield for Government land by periods. The middle shows that for private land, assuming protection and regulation. The top shows the combined yield of both Government land and that which is now private.

This diagram shows the past consumption of the two mills and attempts to approximate the future supply.

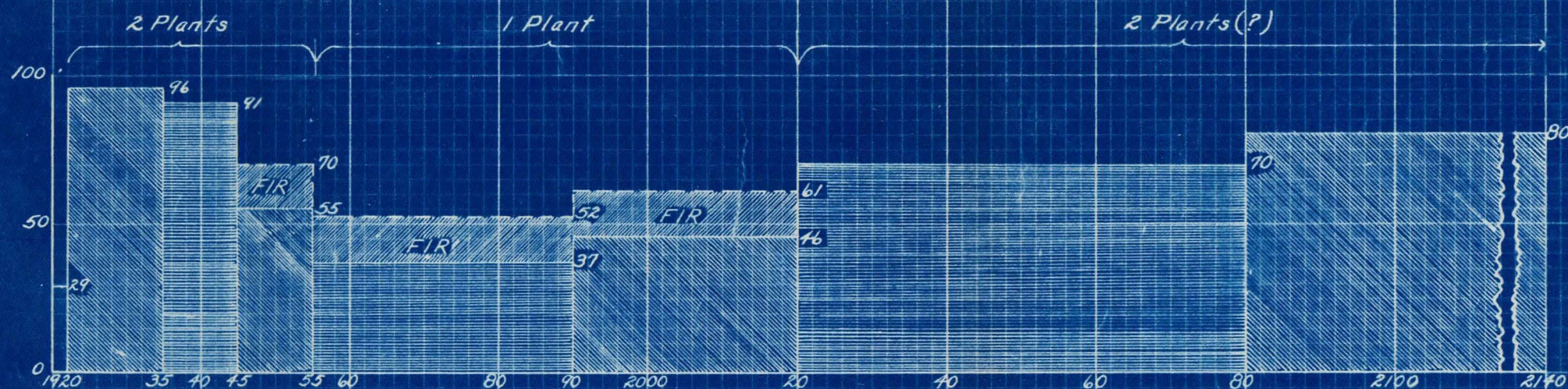
It is very probable that the Fruit Growers Supply Co. will not be able to budget their private cuttings to give a uniform supply of seven million feet for 55 years. In this case the plant will be limited to the allowable cut on Government land.

The available supply of Red River Lumber Co. timber in the Eastern Lassen Working Circle approximates one billion feet. At the present rate of cutting this will be exhausted in less than 10 years. It is estimated that possibly 400 million feet will go to the three Susanville Mills. This holds promise of intense competitive bidding for stumpage.

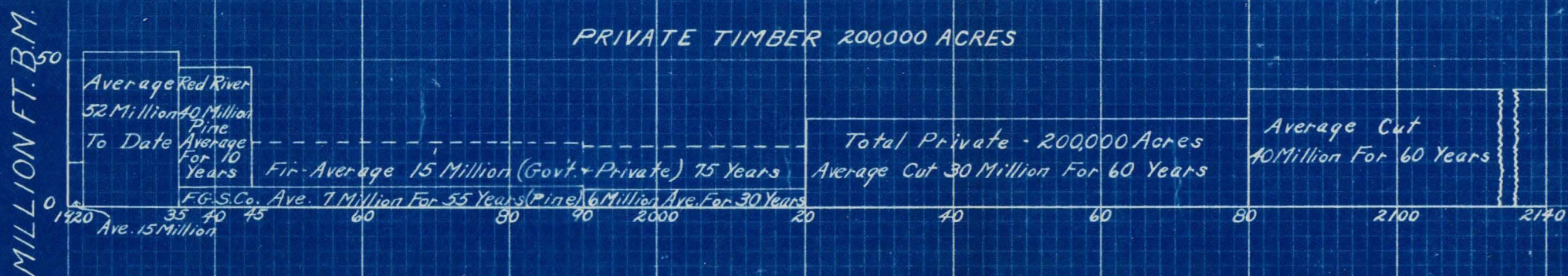
TIMBER SUPPLY DIAGRAM EASTERN LASSEN WORKING CIRCLE

Fig.-15-

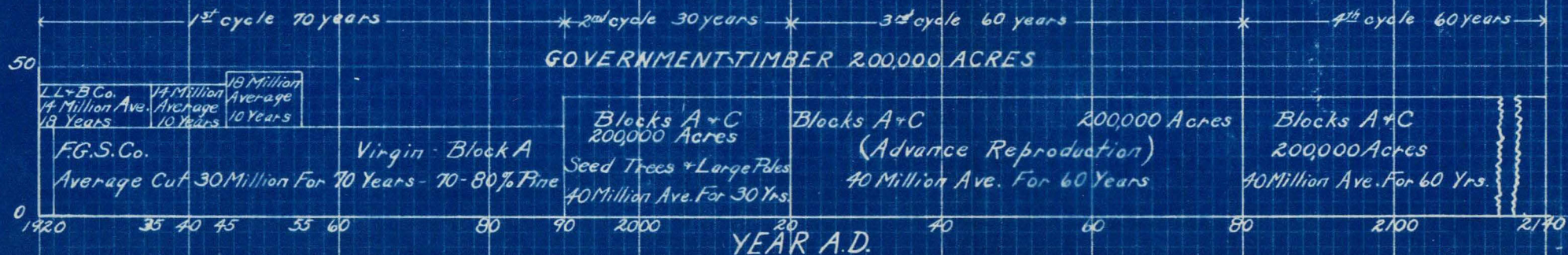
COMBINED TIMBER LAND 400,000 ACRES



PRIVATE TIMBER 200,000 ACRES



GOVERNMENT TIMBER 200,000 ACRES



VIII. SUMMARIZED TABLES OF AREA, VOLUME AND STATUS

A. UNCUT GOVERNMENT TIMBER IN FRUIT GROWERS SUPPLY COMPANY SALE, 4-3-22 - BLOCK A.

T & R	P P MEM	S P MEM	W F MEM	I C MEM	R F MEM	L P MEM	TOTAL MEM	Timbered Acres
31-8	674	-	-	-	-	-	674	51
31-9	49,116	6,562	33,295	1,449	723	444	91,589	3,790
32-8	107,277	775	23,832	1,654	-	-	133,538	8,330
32-9	39,092	283	8,935	693	-	-	49,003	2,580
32-10	44,139	1,345	8,772	1,873	23	-	56,152	4,260
32-11	Optional	-	-	-	-	-	-	-
33-8	10,748	-	-	-	-	-	10,748	980
33-9	163,955	-	20,113	824	-	-	184,892	11,530
33-10	186,918	96	8,347	3,281	-	-	198,642	16,074
Total	601,919	9,061	103,294	9,774	746	444	725,238	47,595
Net Cut	481,540	7,250	41,318	7,819	298	111	538,336	Pine 80% cut, L P 25% Fir 40%
Net Cut	517,650	7,792	41,318	7,819	298	111	574,988	Cedar 80% Pine 86% cut Fir 40%
Lava bed Optional	45,888	-	-	4	-	-	45,892	Cedar 80% 7,720
* 32-10	23,524	1,927	5,784	2,384	38	-	33,657	2,460
32-11	5,190	-	-	-	-	-	5,190	Merchant- able *
33-10	2,549	-	22	8	-	-	2,579	Merchant- able 540
	77,151	1,927	5,806	2,396	38	-	87,318	Scattered Stand 11,400
Additional to exclude from cutting area if seen fit.								
** 32-8	10,853	-	381	-	-	-	11,234	590
***32-10	3,818	-	32	80	-	-	3,930	Merchant- able ** 640
33-10	22,230	66	1,174	1,186	-	-	24,656	Scattered Stand 3,400
Total	36,901	66	1,587	1,266	-	-	39,820	Scattered Stand 4,630

*Can go out by Eagle Lake. **West of W.P.R.R. and can go with balance of Block A.
***Parts of Sections 1, 2, 3 and 10.

B. PRIVATE TIMBER IN FRUIT GROWERS SUPPLY SALE, BLOCK A.

<u>Fruit Growers Supply Company Uncut</u>					:	<u>Red River and Waland Uncut</u>				:	<u>Grand Total</u>			
				Fir &	:				Fir &	:				Fir &
<u>T & R</u>	<u>Total</u>	<u>Acres</u>	<u>Pine</u>	<u>Others</u>	:	<u>Total</u>	<u>Acres</u>	<u>Pine</u>	<u>Others</u>	:		<u>Acres</u>	<u>Pine</u>	<u>Others</u>
	<u>Acres</u>	<u>Left</u>	<u>MBM</u>	<u>MBM</u>	:	<u>Acres</u>	<u>Left</u>	<u>MBM</u>	<u>MBM</u>	:	<u>Acres</u>	<u>Left</u>	<u>MBM</u>	<u>MBM</u>
30-9	5,200	-	-	-	:	600	-	-	-	:	5,800	-	-	-
31-9	13,040	3,995	65,201	26,399	:	720	560	8,400	2,800	:	13,760	4,555	73,601	29,199
32-8	120	120	2,292	455	:	640	640	10,017	3,288	:	760	760	12,309	3,743
32-9	2,440	240	5,380	190	:	-	-	-	-	:	2,440	240	5,380	190
32-10	480	2,400	2,400	-	:	1,040	1,040	10,000	6,900	:	1,520	3,440	12,400	6,900
33-9	480	480	2,400	500	:	80	80	1,000	200	:	560	560	3,400	700
33-10	360	360	1,800	-	:	-	-	-	-	:	360	360	1,800	-
Total	22,120	7,595	79,473	27,544	:	3,080	2,320	29,417	13,188	:	25,200	9,915	108,890	40,732

C. PRIVATE TIMBER IN BALANCE OF BLOCK A.

<u>Fruit Growers Supply Company Outside</u>					:	<u>Red River Outside</u>				:	<u>Grand Total</u>			
30-8	2,240	1,680	19,683	23,427	:	-	-	-	-	:	2,240	1,680	19,683	23,427
31-7	80	80	1,310	385	:	640	640	2,984	3,613	:	720	720	4,294	3,998
31-8	5,580	5,580	88,434	50,358	:	-	-	-	-	:	5,580	5,580	88,434	50,358
32-6	-	-	-	-	:	2,040	2,040	33,000	5,000	:	2,040	2,040	33,000	5,000
32-7	4,200	4,200	67,945	10,504	:	4,160	4,160	67,000	10,000	:	8,360	8,360	134,945	20,504
32-8	720	720	11,210	4,345	:	-	-	-	-	:	720	720	11,210	4,345
33-6	-	-	-	-	:	320	320	1,600	-	:	320	320	1,600	-
33-7	-	-	-	-	:	6,560	6,560	98,400	6,560	:	6,560	6,560	98,400	6,560
Total	12,820	12,260	188,582	89,019	:	13,720	13,720	202,984	25,173	:	26,540	25,980	391,566	114,192

D. GOVERNMENT TIMBER OUTSIDE SALE, BLOCK A.
(Merchantable Timber)

All land bearing 50% or more pine by volume except a few very heavy sections.

<u>T & R</u>	<u>Timbered Acres</u>	<u>P P MBM</u>	<u>S P MBM</u>	<u>W F MBM</u>	<u>R F MBM</u>	<u>W P MBM</u>	<u>I C MBM</u>	<u>L P MBM</u>	<u>Total M B M</u>
31-6	1,600	18,800	200	8,200	800	-	-	-	28,000
31-7	8,340	66,407	468	48,434	15,346	-	-	1,388	132,043
31-8	6,900	90,344	1,549	49,874	2,927	-	10	6,764	151,468
32-5	1,800	28,900	100	1,600	-	-	1,100	-	31,700
32-6	16,160	229,155	2,350	24,675	200	-	900	120	257,400
32-7	8,560	104,772	1,165	30,157	92	21	1,058	-	137,265
32-8	2,140	15,710	2,165	10,503	54	12	230	-	28,674
33-6	8,750	99,465	-	-	-	-	49	-	99,514
33-7	13,540	228,060	272	16,820	-	-	6,064	-	251,216
33-8	17,660	279,389	8	75,625	-	-	4,796	-	359,818
Total	85,450	1,161,002	8,277	265,888	19,419	33	14,207	8,272	1,477,098
% of stand	-	78.6%	.6%	18.0%	1.3%	-	1.0%	.5%	
Cutting Factor		80.0%	80.0%	40.0%	40.0%	80%	80.0%	0	
Cut in Volume		928,801	6,621	106,355	7,767	26	11,365	(2,063)	1,060,935
							(Inc. L.P. 25%		
Unmerchantable Timber							cut		1,062,998)
30-8	2,760	10,768	197	33,091	9,874		48	5,050	59,028 ✓
31-6	480	2,800		3,300	2,000				8,100
31-7	3,120	5,390		4,000	5,800			2,300	17,490
31-8	2,920	26,677	368	32,028	2,695	15		388	62,171 ✓
32-7	1,280	1,668	514	2,328	681	78			5,269
33-6	1,000	5,290							5,290
Total	11,560	52,512	1,079	74,747	21,050	93	48	7,738	157,267
								Less 20% -	125,814
Unmer. Cut	11,560	52,512	1,079	74,747	21,050	93	48	7,738	157,267
% of Stand		33.7%	.7%	47.3%	13.3%	.1%		4.9%	
Cutting Factor		80.0%	80.0%	40.0%	40.0%	80.0%	80.0%	-0	
Cut in Volume		42,009	863	29,898	8,020	74	38	6,190	87,092

IX. FINANCIAL STATEMENT, LASSEN COUNTY

Taken from State Board of Equalization Report and County Budget.

Estimates

Population	(1930 Census)		12,589
Area	- 4531 square miles -	-	2,899,840 Acres
Assessed acreage	1,081,023 Acres		
Government and water	1,818,817 "		
(National Forest)	(585,995) "		
(Value of National Forest at assessment rates, about	\$2,500,000)		
Timberland about	750,000 Acres		
Farms (crops 86,832) about	473,268 "		
Water	110,000 "		
Range land	1,566,572 "		
Assessed Valuation			12,263,896
Utilities			2,959,170
Total Valuation (52% of true value)			15,223,066
Of the above timber is about \$3,000,000 or 20% in value			
Milling Plants	3,900,000 " 26% " "		
Farms	3,000,000 " 20% " "		
Grazing	1,500,000 " 10% " "		
Expenditures	1935	-	574,322
(Tax levy about	250,000)		
(Accruals, various funds	325,000)		
Education about	260,000		
Roads	82,000		
Library, horticulture, extension	17,000		
Indigent, State Aid,			
Hospitals, cemeteries	93,000		
Salaries, general, etc.	122,322		
Bonded debt (including cities)	1935		341,350
Bond retirement budget about	43,000		
Value of public improvements about	-	-	1,000,000

X. STOCK AND STAND TABLES

(Tables Following)

The stand tables do not check closely with the summary of completed sections from which the graphs were drawn. This summary is the best average for the cutting areas, however, it was not tallied by the "Dunning Crown Classification."

The stand tables are made from the record sheets of the permanent normal loss sample strips which were tallied by Dunning's system. All of the normal loss sample record strip data were not used in compiling the stand tables. For the "Lasco" area of pure ponderosa-Jeffrey Pine type, mixed lodgepole areas and acquired clear cut areas were eliminated. For the Fruit Growers' Government cuttings, only the Logan Mountain strips were used. For the Fruit Growers' private cuttings, burned areas and lodgepole types were eliminated.

INDEX TO FOLLOWING TABLES.

Pages A-17 and A-18. Tabulation of timber cut and left on "Lasco" Area. Pure Ponderosa Pine type.

Pages A-19 and A-20. Tabulation of timber cut and left on Logan Mountain - mixed Pine-Fir type.

Page A-21. Stand table for Lasco Area - Pure Ponderosa Pine type.

Pages A-22 and A-23. Stand table for Logan Mountain Area - mixed Pine-Fir type.

Pages A-24 to A-27. Stand and Stock Tables for Fruit Growers private lands. Mixed Pine-Fir type.

S U M M A R Y

Timber Cut and Left 1/1/35
Completed Sections - Eastern Lassen Working Circle
Lassen Lumber & Box Company Sales.

T - R & Section:	Cutover & Timbered: Acres	Cut - M feet B.M.				Left - M feet B.M.			
		P.P.&S.P.	W.F.	Others	Total	P.P.&S.P.	W.F.	Others	Total
29-8									
1	433	6260	190	330	6780	1335	54	150	1539
12	327	5392	2939	23	8354	811	374	46	1231
13	294	4362	910	-	5272	429	159	-	588
29-9									
5	642	9506	-	-	9506	1416	-	-	1416
6	640	9587	4	45	9636	1856	5	25	1886
7	614	7794	323	33	8150	1275	48	122	1445
8	590	9770	2	-	9772	1047	1	-	1048
17	313	5109	3	-	5112	692	1	-	693
18	568	9793	3	26	9822	1121	6	18	1145
19	270	4626	1	82	4709	466	1	5	472
20	230	5369	302	44	5715	322	45	19	386
30-8									
9&10	226	1858	446	46	2350	143	48	636	827
13	625	8547	567	5	9119	3868	26	2	3896
14	616	9044	712	4	9760	2316	51	39	2406
15	595	5472	425	210	6107	1420	105	772	2297
22	491	2614	7	60	2681	788	3	832	1623
23	620	8187	27	243	8457	1539	4	197	1740
24	640	10806	485	4	11295	3063	33	4	3100
25	629	10116	42	14	10172	3385	-	1	3386
26	598	6173	-	414	6587	723	-	645	1368
27	188	54	-	-	54	75	-	507	582
35	395	3097	-	68	3165	670	-	106	776
36	640	14000	Acquired Cutover						
					14000	131	-	5	136
30-9									
1	18	81	2	-	83	26	4	33	63
8	156	2004	3	-	2007	798	-	-	798
9	125	1972	-	56	2028	627	-	13	640
12	28	473	26	3	502	18	22	34	74
17	627	10558	-	1	10559	2552	-	-	2552
18	640	11447	97	18	11562	3046	7	4	3057
19	640	10275	472	1	10748	3437	82	-	3519
20	550	6753	-	1	6754	1932	-	-	1932

T - R	Cutover	Cut - M feet B. M.					Left - M feet B. M.				
&	Timbered	:	:	:	:	:	:	:	:	:	:
Section	Acres	P.P.&S.P.	W.F.	Others	Total	:	P.P.&S.P.	W.F.	Others	Total	:
29	640	7918	9	-	7927	:	1483	-	-	1483	:
30	634	9437	127	1	9565	:	2308	2	-	2310	:
31	640	9556	-	3	9559	:	1740	5	-	1745	:
32	640	10488	-	3	10491	:	1585	-	-	1585	:
16	433	Acquired Cutover			?	:	57	-	-	57	:
Total	16955	238498	8124	1738	248360	:	48500	1086	4215	53801	:
Average	(16522)	14435	492	105	15032	:	(16955)				:
(+ L.B.M. per A.)						:	2861	64	248	3173	:

Totals and averages for Lassen Lumber and Box Co. Sale 11/16/17.
Completed Sections.

Fruit Growers Supply Company Sales

T - R & Section	: Cut :Timbered: :Acres	Cut M feet B. M.				Left M feet B. M.			
		:P.P.&S.P.	: W. F.	: Others:	: Total	:P.P.&S.P.	: W.F.	:Others:	:Total
31-9	:	:	:	:	:	:	:	:	:
1	: 34	: 600	: 433	: 5	: 1038	: 132	: 221	: -	: 353
2&3	: 464	: 17518	: 6651	: 345	: 24514	: 1952	: 803	: 51	: 2806
12	: 617	: 6836	: 5220	: 79	: 12135	: 2625	: 1954	: 208	: 4787
13	: 530	: 9953	: 6315	: 35	: 16303	: 3213	: 2272	: -	: 5485
14	: 318	: 5075	: 3621	: 184	: 8880	: 1257	: 1091	: 64	: 2412
27-28-33	: 760	: 649	: 66	: 6	: 721	: 63	: 9	: 50	: 122
35	: 55	: 455	: 276	: 10	: 741	: 77	: 87	: 38	: 202
31-10	:	:	:	:	:	:	:	:	:
30	: 72	: 677	: 34	: 89	: 800	: 104	: 16	: 43	: 163
31	: 71	: 757	: 200	: 81	: 1038	: 173	: 74	: 45	: 292
32-8	:	:	:	:	:	:	:	:	:
1	: 606	: 10017	: 1287	: 68	: 11372	: 2557	: 740	: 68	: 3365
2	: 476	: 9491	: 1166	: 64	: 10721	: 2247	: 587	: 28	: 2862
10&11	: 91	: 2177	: 297	: -	: 2474	: 479	: 180	: -	: 659
12	: 201	: 3678	: 487	: 22	: 4187	: 514	: 774	: 4	: 1292
32-9	:	:	:	:	:	:	:	:	:
2	: 576	: 6021	: 1017	: 527	: 7565	: 1780	: 1085	: 198	: 3063
3	: 631	: 4894	: 669	: 119	: 5682	: 1776	: 693	: 30	: 2499
5	: 193	: 3080	: 425	: -	: 3505	: 766	: 3	: -	: 769
6	: 345	: 5569	: 717	: 34	: 6320	: 1947	: 472	: 2	: 2421
7	: 550	: 8738	: 1115	: 55	: 9908	: 1706	: 1235	: 10	: 2951
8	: 120	: 1997	: 277	: -	: 2274	: 729	: 116	: -	: 845
10	: 627	: 5846	: 1757	: 295	: 7898	: 1250	: 1485	: 94	: 2829
11	: 274	: 321	: 114	: 27	: 462	: 555	: 777	: 10	: 1342
13	: 489	: 5258	: 1898	: 443	: 7599	: 2220	: 1347	: 110	: 3677
14	: 483	: 3714	: 1914	: 126	: 5754	: 1274	: 2097	: 11	: 3382
15	: 640	: 7773	: 2312	: 709	: 10794	: 1582	: 1421	: 141	: 3144
17	: 473	: 8069	: 1045	: 49	: 9163	: 2902	: 275	: -	: 3177
20	: 232	: 3977	: 501	: -	: 4478	: 702	: 135	: -	: 836
22	: 520	: 7737	: 1678	: 800	: 10215	: 1293	: 613	: 122	: 2028
23	: 300	: 4048	: 920	: 226	: 5194	: 1157	: 379	: 67	: 1603
24	: 92	:	:	:	:	:	:	:	:
	: 464	: 8106	: 5343	: 91	: 13540	: 2164	: 1489	: 22	: 3675
25-26	: 95	:	:	:	:	:	:	:	:
	: 307	: 4760	: 2784	: 190	: 7734	: 1590	: 2114	: 46	: 3750
27	: 329	: 5409	: 502	: 5	: 5916	: 885	: 260	: -	: 1145
34	: 194	: 3017	: 248	: 4	: 3269	: 560	: 117	: -	: 677
35	: 104	:	:	:	:	:	:	:	:
	: 94	: 2360	: 534	: 170	: 3064	: 1117	: 1094	: 130	: 2341

Fruit Growers Supply Company Sales - Cont'd.

T - R : Cut		Cut M feet B. M.				Left M feet B. M.			
& :Timbered:									
Section:	Acres	P.P.&S.P.:	W. F.:	Others:	Total	P.P.&S.P.:	W. F.:	Others:	Total
17-18-19									
20-21-23									
& 29	1056	21443	8868	810	31121	3734	2329	134	6197
18	348	5681	1929	121	7731	2818	794	17	3629
29-32-33	307								
	201	6408	2099	269	8776	1721	944	48	2713
33-9									
5	532	5875	801	-	6676	2051	2491	-	4542
8	359	4331	590	-	4921	1495	449	-	1944
TOTALS	5230	212315	66110	6058	284483	55167	33022	1791	89980
AVERAGE:	(Ft. B.M.)	13941	4340	398	18679	3622	2168	118	5908
per A.									

Fruit Growers Supply Company Sales - 4/3/22 as of 1/1/35.

STAND TABLE

Site III

Ponderosa-Jeffrey Pine Type
Basis 181.9 strip acres sample
Site - height index 130 feet
Lassen Lumber & Box Company Sale 11/16/17.

D.B.H.	Crown Classification										Def.	Totals
	1	2	3	4	5	6	7					
4	1.830	1.760				.737	.044		.071			4.442
6	1.352	1.517				.649	.066		.171			3.755
8	.891	.907				.236	.027		.149			2.210
10	1.045	.698				.115	.044		.148			2.050
TOTALS	5.118	4.882				1.737	0.181		0.539			12.457
12	.803	.264				.066	.033		.044			1.210
14	.649	.231				.049	.006		.055			0.990
16	.583	.170	.006	.011		.060	.005		.028			0.863
18	.407	.099	.017	.011		.016	.005		.044			0.599
20	.285	.067	.099	.027					.011			0.489
22	.215	.066	.170	.077		.011			.016			0.555
24	.154	.016	.286	.027					.022			0.505
26	.082	.011	.368	.044	.006				.005			0.516
28			.324	.039	.005							0.328
30			.368	.017								0.385
32	.005		.308	.028	.005							0.346
34			.215	.005	.005							0.225
36			.154		.011							0.165
38			.132									0.132
40			.077		.017							0.094
40 /			.027									0.027
TOTALS	3.183	0.924	2.551	0.286	0.049	0.202	0.049		0.225			7.469

PONDEROSA PINE STAND TABLE (TREES PER ACRE)

Logan Mountain PP - WF Type - Site Index 120 - 130 feet
Basis 208.4 Chains of Strip - 104.2 Acres.

Corrected for 1929 Blowdown

Crown Class										
D.B.H. :	1	2	3	4	5	6	7	Defective	Total	
4	: 4.866	: 2.322	:	:	:	: .144	: -	: .873	:	8.205
6	: 2.821	: .777	:	:	:	: .134	: .019	: .701	:	4.452
8	: 2.380	: .441	:	:	:	: .096	: .056	: .365	:	3.338
10	: 1.180	: .278	:	:	:	: .086	: -	: .288	:	1.832
TOTAL	: 11.247	: 3.818	:	:	:	: .460	: .075	: 2.227	:	17.827
12	: .806	: .336	:	:	:	: .096	: .067	: .269	:	1.574
14	: .518	: .288	:	:	:	: .029	: .029	: .163	:	1.027
16	: .314	: .134	: .019	: .019	:	: -	: .010	: .096	:	.652
18	: .298	: .125	: .048	: .019	:	: .029	:	: .067	:	.586
20	: .326	: .096	: .058	: .077	:	:	:	: .010	:	.567
22	: .125	: .029	: .134	: .029	: .019	:	:	: -	:	.336
24	: .086	: .010	: .192	: .077	: .010	:	:	: .010	:	.385
26	: .067	:	: .288	: .077	: .010	:	:	: .010	:	.452
28	: -	:	: .221	: .077	: .029	:	:	: -	:	.327
30	: .019	:	: .163	: .048	: .067	:	:	: -	:	.297
32	:	:	: .144	: .086	: .019	:	:	: .019	:	.268
34	:	:	: .086	: .067	: .038	:	:	:	:	.191
36	:	:	: .019	:	: .029	:	:	:	:	.048
38	:	:	: .058	:	: .019	:	:	:	:	.077
40	:	:	: .019	:	: .010	:	:	:	:	.029
40 /	:	:	: .019	:	: .019	:	:	:	:	.038
TOTAL	: 2.619	: 1.018	: 1.468	: .576	: .269	: .154	: .106	: .644	:	6.854

WHITE FIR STAND TABLE (TREES PER ACRE)

Logan Mountain PP - WF Type - Site Index 120 - 130 feet
Basis 208.4 Chains of Strip - 104.2 Acres.

Corrected for 1929 Blowdown

D.B.H. :	1 :	2 :	3 :	4 :	5 :	6 :	7 :	Def. :	Total
4 :	4.251 :	3.695 :	:	:	:	.317 :	:	.480 :	8.743
6 :	2.418 :	1.564 :	:	:	:	.260 :	:	.326 :	4.538
8 :	1.622 :	1.084 :	:	:	:	.173 :	:	.317 :	3.196
10 :	1.392 :	.643 :	:	:	:	.077 :	.019 :	.288 :	2.419
TOTAL :	9.683 :	6.986 :	:	:	:	.797 :	.019 :	1.411 :	18.896
12 :	.835 :	.499 :	:	:	:	.067 :	.038 :	.192 :	1.631
14 :	.470 :	.653 :	:	:	:	.048 :	.010 :	.211 :	1.392
16 :	.489 :	.422 :	.010 :	:	:	.010 :	:	.250 :	1.181
18 :	.413 :	.250 :	.029 :	.019 :	:	:	:	.173 :	.884
20 :	.278 :	.144 :	.125 :	.077 :	:	:	:	.096 :	.720
22 :	.144 :	.067 :	.250 :	.086 :	:	:	:	.067 :	.614
24 :	.038 :	:	.230 :	.038 :	:	:	:	.010 :	.316
26 :	.010 :	:	.163 :	.058 :	:	:	:	.019 :	.250
28 :	:	:	.134 :	.038 :	.010 :	:	:	.010 :	.192
30 :	:	:	.134 :	.058 :	.010 :	:	:	.010 :	.212
32 :	:	:	.048 :	.019 :	.058 :	:	:	.019 :	.144
34 :	:	:	.019 :	.029 :	.029 :	:	:	:	.077
36 :	:	:	:	:	.019 :	:	:	:	.019
38 :	:	:	.010 :	:	.010 :	:	:	:	.020
40 :	:	:	:	:	:	:	:	:	-
40 f :	:	:	:	:	.010 :	:	:	:	.010
TOTAL :	2.677 :	2.035 :	1.152 :	.422 :	.146 :	.125 :	.048 :	1.057 :	7.662

Fruit Growers' Supply Company Land

PONDEROSA AND SUGAR PINE STAND TABLE (TREES PER ACRE) SITE III.

Strip Acres = 261.8

Tree Classes											
D.B.H.	1	2	3	4	5	6	7	Defs.	Total		
4	2.605	1.210				0.423	0.011	0.168	4.417		
6	1.841	0.805				0.202	0.022	0.194	3.064		
8	1.283	0.454				0.160	0.019	0.114	2.030		
10	1.142	0.504				0.110	0.049	0.122	1.927		
TOTAL	6.871	2.973				0.895	0.101	0.598	11.438		
12	0.557	0.275		0.003		0.072	0.030	0.022	0.959		
14	0.504	0.309		0.026		0.034	0.003	0.068	0.944		
16	0.362	0.301		0.011		0.049	0.019	0.061	0.803		
18	0.210	0.320	0.080	0.011		0.026	0.007	0.034	0.688		
20	0.068	0.236	0.145	0.053	0.003	0.022	0.007	0.030	0.564		
22	0.045	0.118	0.187	0.022			0.007	0.007	0.386		
24		0.072	0.106	0.026		0.003	0.003	0.007	0.217		
26		0.019	0.126	0.011				0.007	0.163		
28		0.007	0.084		0.003			0.011	0.105		
30			0.042		0.003			0.003	0.048		
32			0.022		0.003			0.003	0.028		
34			0.019		0.003				0.022		
36											
38					0.003				0.003		
40											
42											
44								0.003	0.003		
46								0.003	0.003		
48								0.003	0.003		
50											
TOTAL	1.746	1.657	0.811	0.163	0.018	0.206	0.076	0.262	4.939		

WHITE FIR STAND TABLE (TREES PER ACRE)

SITE III. Strip Acres = 261.8

Tree Classes										
D.B.H.	1	2	3	4	5	6	7	Defs.	Total	
4	4.190	2.807				1.340	0.003	1.726	10.066	
6	2.929	1.791				0.664	0.003	1.165	6.552	
8	1.906	1.241				0.359		0.741	4.247	
10	1.478	1.084				0.320		1.073	3.955	
TOTAL	10.503	6.923				2.683	0.006	4.705	24.820	
12	0.779	0.557				0.080		0.412	1.828	
14	0.661	0.439	0.003	0.011		0.045		0.576	1.735	
16	0.393	0.466	0.015	0.003		0.022	0.003	0.488	1.390	
18	0.252	0.328	0.053	0.015		0.019		0.462	1.129	
20	0.053	0.175	0.122	0.015		0.003	0.003	0.317	0.688	
22	0.007	0.194	0.168	0.011	0.030			0.366	0.776	
24		0.068	0.141	0.007	0.129			0.339	0.684	
26	0.003	0.026	0.122	0.003	0.175			0.370	0.699	
28			0.106	0.007	0.160			0.324	0.597	
30		0.007	0.045		0.122			0.194	0.368	
32			0.049		0.168			0.267	0.484	
34			0.015		0.156			0.198	0.369	
36			0.007		0.114			0.240	0.361	
38			0.019		0.099			0.221	0.339	
40			0.003		0.076			0.137	0.216	
42					0.072			0.114	0.186	
44					0.045			0.118	0.163	
46					0.026			0.114	0.140	
48					0.030			0.061	0.091	
50					0.011			0.076	0.087	
52					0.011			0.053	0.064	
54					0.007			0.057	0.064	
56					0.011			0.045	0.056	
58								0.030	0.030	
60								0.045	0.045	
62								0.007	0.007	
64								0.007	0.007	
66								0.003	0.003	
TOTAL	2.148	2.260	0.868	0.072	1.442	0.169	0.006	5.641	12.606	

PONDEROSA AND SUGAR PINE STOCK TABLE (PER ACRE)

SITE III.

STRIP ACRES - 261.8

(Gross Volumes)

Tree Classes.

D.B.H.	1	2	3	4	5	6	7	Def.	Total
	Bd. Ft.	Bd.Ft.	Bd.Ft.	Bd.Ft.	Bd.Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.
4	:	:	:	:	:	:	:	:	:
6	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
10	:	:	:	:	:	:	:	:	:
TOTAL	:	:	:	:	:	:	:	:	:
12	18.8	10.0	:	0.1	:	2.2	0.9	0.6	32.6
14	26.5	18.7	:	2.6	:	1.6	0.1	3.7	53.2
16	35.5	34.8	:	1.3	:	3.4	1.2	5.2	81.4
18	29.8	56.0	15.5	1.4	:	3.0	0.4	4.4	110.5
20	14.2	57.9	39.9	16.8	1.9	3.2	0.8	6.6	141.3
22	14.5	40.6	67.8	6.5	:	:	1.8	1.8	133.0
24	:	31.9	50.2	15.2	:	0.7	1.4	2.7	102.1
26	:	12.2	69.3	8.1	:	:	:	1.9	91.5
28	:	7.2	72.3	:	3.8	:	:	6.1	89.4
30	:	:	42.1	:	4.0	:	:	1.9	48.0
32	:	:	24.3	:	2.5	:	:	4.6	31.4
34	:	:	25.2	:	4.4	:	:	:	29.6
36	:	:	:	:	:	:	:	:	:
38	:	:	:	:	9.5	:	:	:	9.5
40	:	:	:	:	:	:	:	:	:
42	:	:	:	:	:	:	:	:	:
44	:	:	:	:	:	:	:	18.2	18.2
46	:	:	:	:	:	:	:	17.0	17.0
48	:	:	:	:	:	:	:	21.8	21.8
50	:	:	:	:	:	:	:	:	:
TOTAL	139.3	269.3	406.6	52.0	26.1	14.1	6.6	96.5	1,010.5

50.5 (5% Cull)

960. Net.

WHITE FIR STOCK TABLE (PER ACRE)

SITE III. STRIP ACRES - 261.8

Gross Volumes

Tree Classes

D.B.H.	1	2	3	4	5	6	7	Def.	Total
	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.	Bd. Ft.
4	:	:	:	:	:	:	:	:	:
6	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
10	:	:	:	:	:	:	:	:	:
TOTAL	:	:	:	:	:	:	:	:	:
12	30.4	22.5	:	:	:	3.3	:	16.2	72.4
14	41.6	30.6	0.4	1.3	:	2.7	0.3	33.2	110.1
16	39.8	57.8	1.9	0.7	:	1.3	:	47.9	149.4
18	38.0	57.2	11.8	3.0	:	2.5	0.2	67.8	180.5
20	11.3	46.2	35.5	4.0	:	0.9	:	74.0	171.9
22	2.1	63.5	69.7	4.1	14.8	:	:	124.4	278.6
24	:	32.4	69.2	3.7	74.4	:	:	152.1	331.8
26	2.0	13.9	77.6	2.9	122.8	:	:	236.2	455.4
28	:	:	84.3	4.7	141.5	:	:	268.3	498.8
30	:	6.0	45.6	:	129.4	:	:	181.1	362.1
32	:	:	60.8	:	217.5	:	:	305.6	583.9
34	:	:	21.5	:	247.2	:	:	284.7	553.4
36	:	:	11.3	:	209.5	:	:	396.0	616.8
38	:	:	31.9	:	210.8	:	:	440.3	683.0
40	:	:	6.2	:	181.6	:	:	322.9	510.7
42	:	:	:	:	187.0	:	:	278.3	465.3
44	:	:	:	:	134.1	:	:	357.8	491.9
46	:	:	:	:	83.6	:	:	383.7	467.3
48	:	:	:	:	117.3	:	:	234.2	351.5
50	:	:	:	:	50.1	:	:	330.8	380.9
52	:	:	:	:	58.6	:	:	270.9	329.5
54	:	:	:	:	32.8	:	:	296.7	329.5
56	:	:	:	:	66.1	:	:	240.2	306.3
58	:	:	:	:	:	:	:	182.6	182.6
60	:	:	:	:	:	:	:	300.0	300.0
62	:	:	:	:	:	:	:	91.3	91.3
64	:	:	:	:	:	:	:	29.5	29.5
TOTAL	165.2	330.1	527.7	24.4	2,279.1	10.7	0.5	5,946.7	9,284.4

Cull 20% on Class 3 to 7 568

Net Volume 2770 board feet.

Five-year Cutting Budget and Sale Program Calendar Years 1959, 1960, 1961, 1962, 1963 Inclusive
 (Show all sales under contract and sales proposed for advertising by year.)

Designation of Sale or Name of Proposed Sale and Tentative Date of Advertisement	Total Volume in Sale M MBM	Estimated Cut for Each C.Y. 19 <u>59</u> , 19 <u>60</u> , 19 <u>61</u> , 19 <u>62</u> , 19 <u>63</u>			Access Road Construction (on System & M-4 Roads) Each Year					
		Year	M MBM	Acres	By Forest Service			By Operator		
					Road Number	Miles	Cost	Road Number	Miles	Cost
Little Valley Timber Co. 7/25/55	10	1959	10	3,000				Roads Completed		
Little Valley Lumber Co. 11/27/57	22	1959	11	1,500				33N02	2.6	20,100
		1960	11	1,500				33N34	3.7	29,700
Pansy Path June, 1959	27	1959	5	500				32N09	6.3	108,000
		1960	11	1,000				32N11	4.6	83,000
		1961	11	1,000				32N19	0.9	18,000
								32N19-A	1.25	15,000
								31N10-C	1.5	18,000
Feather Lake May, 1960	18	1960	3	600				No Permanent Roads		
		1961	10	2,100						
		1962	5	1,000						
Cone Lake Sept., 1961	25	1962	10	1,500				31N10	2.0	25,000
		1963	10	1,500				31N10-C	1.0	12,000
								31N10-D	1.0	12,000
Stephens Nov., 1961	20	1962	10	2,600				31N08.1	1.5	18,000
		1963	10	2,600				31N08.2	2.0	24,000
								31N09-A1	2.6	31,000
								31N18.2	1.5	16,000
								32N11.2	2.0	20,000
								31N09-A2	1.9	20,000
								31N08-B2	2.0	20,000

Approved ERNEST L. TURNERRevised APR 15 1959
(Date)By J. H. MICHELS

254-R5 Revised 4-2-56
 Supersedes Revision 12-27-54

Five-year Cutting Budget and Sale Program Calendar Years 1959, 1960, 1961, 1962, 1963 Inclusive
 (Show all sales under contract and sales proposed for advertising by year.)

Designation of Sale or Name of Proposed Sale and Tentative Date of Advertisement	Total Volume in Sale MMBM	Estimated Cut for Each C.Y. 1959, 1960, 1961, 1962, 1963			Access Road Construction (on System & M-4 Roads) East of Lake					
		Year	MMBM	Acres	By Forest Service			By Operator		
					Road Number	Miles	Cost	Road Number	Miles	Cost
Black Butte										
June, 1962	20	1962	5	700				32N10	3.0	55,000
		1963	10	1,500				32N10-C	5.5	90,000
								32N10-F	3.0	45,000
Bogard Butte										
Nov., 1963	25	--	--	--				32N10	5.0	90,000
								32N10-A	3.2	46,000
								32N10-B	4.4	65,000
								32N11-A	7.0	105,000
Robbers Creek										
Nov., 1963	25	--	--	--				30N21	6.0	110,000

Approved ERNEST L. TURNERRevised APR 15 1959
(Date)

254-R5 Revised 4-2-56
 Supersedes Revision 12-27-54

By J. H. MICHELS

Five-year Cutting Budget and Sale Program Calendar Years 1959, 1960, 1961, 1962, 1963 Inclusive
 (Show all sales under contract and sales proposed for advertising by year.)

Designation of Sale or Name of Proposed Sale and Tentative Date of Advertisement	Total Volume in Sale M MBM	Estimated Cut for Each C.Y. 19 <u>59</u> , 19 <u>60</u> , 19 <u>61</u> , 19 <u>62</u> , 19 <u>63</u>			Access Road Construction (on System & M-4 Roads) Next Year					
		Year	M MBM	Acres	By Forest Service			By Operator		
					Road Number	Miles	Cost	Road Number	Miles	Cost
Cheney Calif. Lbr. Co. 7/21/58	2	1959	2	100				No Permanent Roads		
Glenco Forest Products 3/14/58	8	1959	4	80	30N11	8.3	75,000			
		1960	4	80						
Plumas Lumber Company 12/23/58	33	1959	8	1,000				29N01.2	6.8	102,000
		1960	8	1,000				29N01-A	1.3	20,000
		1961	8	1,000				29N21	2.6	39,000
		1962	9	1,000				28N02-D	2.3	33,000
								(Plumas)		
Blacks Mtn. March, Annually	5	1959	1	300				No Permanent Roads		
		1960	1	300						
		1961	1	300						
		1962	1	300						
		1963	1	300						
Gooch Valley Salvage <u>1</u> / August, 1959	3	1959	1	--				No Permanent Roads		
		1960	1	--						
		1961	1	--						
Keddie Mountain August, 1959	30	1959	5	500				28N08	3.76	50,000
		1960	10	1,000				28N08-A	1.35	20,000
		1961	10	1,000				28N08-B	.79	15,000
		1962	5	500						

Approved ERNEST L. TURNERRevised APR 15 1959
(Date)

254-R5 Revised 4-2-56
 Supersedes Revision 12-27-54
1/ Salvage

By J. H. MICHELS

Five-year Cutting Budget and Sale Program Calendar Years 1959, 1960, 1961, 1962, 1963 Inclusive
(Show all sales under contract and sales proposed for advertising by year.)

[illegible]

Approved ERNEST L. TURNER

Revised APR 15 1959
(Date)

By *J. H. MICHELS*

254-R5 Revised 4-2-56
Supersedes Revision 12-27-54

Five-year Cutting Budget and Sale Program C.Y. 1957-1958-1959-1960-1961 Inclusive.(Show all sales under contract and sales proposed for advertising by year.)

Name of Sale or Proposed Sale & Date of Advertisement	Total	Estimated Cut for Each C.Y.:			Access Road Construction (on System & M-4 Roads)						
	Volume	1957-1958-1959-1960-1961			Each Year						
	in				By Forest Service			By Operator			
	Sale	Year	M	Gross	Road	Miles	Cost	Road	Miles	Cost	
	MMB			Acres	Number			Number			
Little Valley Timber Co.	26	1957	24	6,000							
7/25/55 (Ebe Lake Unit)		1958	2	500							
Ellingson Lumber Co.	23	1957	13	2,000							
2/6/57 (Cal Mtn. Unit)		1958	10	1,500							
Cone Mtn.	20	1958	10	1,500							
August, 1957		1959	10	1,500							
Pansey Path	30	1958	10	2,200							
Spring, 1958		1959	10	2,200							
		1960	10	2,200							
Stephens	20	1958	10	2,000							
Spring, 1958		1959	10	2,000							
Robbers Creek	25	1959	10	1,300							
Spring, 1959		1960	10	1,300							
		1961	5	700							
Lost Spring	35	1959	10	900							
Spring, 1959		1960	10	900							
		1961	15	1,400							
Black Butte	35	1960	10	1,600							
Spring, 1960		1961	15	2,000							
		1962	15	2,000							

ERNEST L. TURNER
Acting Forest Supervisor

Approved

L-215

4/16/57

Revised:

15/R.L. Lessel
(Date)

Rev.

APR 30 1957

Five-year Cutting Budget and Sale Program C.Y. 1957-1958-1959-1960-1961 Inclusive.
(Show all sales under contract and sales proposed for advertising by year.)

Name of Sale or Proposed Sale & Date of Advertisement	Total	Estimated Cut for Each C.Y.:			Access Road Construction (on System & M-4 Roads)						
	Volume	1957-1958-1959-1960-1961			Each Year						
	in	:	:	Gross	By Forest Service			By Operator			
	Sale	Year	MMB	Acres	Road	Miles	Cost	Road	Miles	Cost	
	MMB	:	:	:	Number	:	:	Number	:	:	
Diamond Mtn. Fall, 1957	40	1958	10	1,200	:	:	:	:	:	:	
		1959	10	1,200	:	:	:	:	:	:	
		1960	10	1,200	:	:	:	:	:	:	
		1961	10	1,200	:	:	:	:	:	:	
Blacks Mtn. Annual Sales	5	1957	1	200	:	:	:	:	:	:	
		1958	1	200	:	:	:	:	:	:	
		1959	1	200	:	:	:	:	:	:	
		1960	1	200	:	:	:	:	:	:	
		1961	1	200	:	:	:	:	:	:	
Swain Mtn. Annual Sales	15	1957	3	200	:	:	:	:	:	:	
		1958	3	200	:	:	:	:	:	:	
		1959	3	200	:	:	:	:	:	:	
		1960	3	200	:	:	:	:	:	:	
		1961	3	200	:	:	:	:	:	:	
Bogard Salvage June, 1957	3	1957	1	14,000	:	:	:	:	:	:	
		1958	1	14,000	:	:	:	:	:	:	
		1959	1	14,000	:	:	:	:	:	:	
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Approved ERNEST L. TURNER
Acting Forest Supervisor
 L-215
 4/16/57

Revised: 15/ R. L. Lessel
 (Date)

Rv:

APR 30 1957

RECORD OF CUT - SAWTIMBER
(Separate sheet for each unit.)

Forest LASSEN

Working Circle

Compartment

C. Y. 1955

YEAR	Volumes in M feet board measure								TOTALS	ACRES
	Ponderosa		White Fir	Sugar	Lodgepole	Incense	Miscel-			
	and/or	Douglas	and/or	Pine	Pine	Cedar	aneous	or		
	Jeffrey	Fir	Red Fir				Other			
Eastern Lassen	10,640		3,939			215			14,794	3,335
Hat Creek	275	4	61	43		12			395	25
Almanor	5,502	126	10,708	2,985		802			20,123	2,545
Butte Creek	8,676		81	112		54			8,923	2,200
Magalia	346	359	151	469		9			1,334	117
Western Lassen	860	12	7,544	1,300	2	30			9,777	1,173*
TOTAL	26,299	530	22,484	4,909	2	1,122			55,346	9,395*

RO-122-R5
(2/1/52)

*Corrections made in accordance with instructions contained in memorandum from Lassen of 2/1/56.

Exhibit #1

RECORD OF CUT - SAWTIMBER
~~(Separated into sheets for each compartment)~~
 C. Y. 1954

Forest Lassen
 Working Circle All
 Compartment —

1 of 2 sheets

	Volumes in M feet board measure									
YEAR	Ponderosa and/or Jeffrey Pine	Douglas Fir	White Fir and/or Red Fir	Sugar Pine	Lodgepole Pine	Incense Cedar	Miscel- laneous or Other	TOTALS	ACRES	
WORKING CIRCLE										
Eastern Lassen										
Allocated	36,763	-	20,023	136	-	149	-	57,071	11,060	
Unallocated	2,492	-	392	-	-	56	-	2,940	300*	
Con. For. Prod.	-	-	-	-	1	-	-	1		
Salvage	515	-	-	-	-	-	-	515		
TOTAL	39,770	-	20,415	136	1	205	-	60,527	11,360	
Hat Creek										
Allocated	7,323	9	942	548	-	115	-	8,937		
Con. For. Prod.	-	-	-	-	-	-	-	-		
Salvage	131	-	1	15	-	-	-	147		
TOTAL	7,454	9	943	563	-	115	-	9,084	2,125	
Almanor										
Allocated	7,235	33	10,298	457	-	492	-	18,515		
Con. For. Prod.	-	-	-	-	-	1	-	1		
Salvage	217	-	61	2	-	-	-	280		
TOTAL	7,452	33	10,359	459	-	493	-	18,796	2,400	
Butte Creek										
Allocated	5,282	-	29	47	-	19	-	5,377		
Con. For. Prod.	-	-	-	-	-	7	-	7		
Salvage	68	-	-	-	-	-	-	68		
TOTAL	5,350	-	29	47	-	26	-	5,452	1,320	

RO-122-R5
 (2/1/52)

*Blacks Mtn. Experimental Forest

Exhibit #1

RECORD OF CUT - SAWTIMBER
~~(Separate record for each section)~~
 C.Y. 1954

Forest Lassen
 Working Circle All
 Compartment —

Volumes in M feet board measure									
YEAR	Ponderosa and/or Jeffrey Pine	Douglas Fir	White Fir and/or Red Fir	Sugar Pine	Lodgepole Pine	Incense Cedar	Miscel- laneous or Other	TOTALS	ACRES
WORKING CIRCLE									
Magalia									
Allocated	741	440	5,882	180	—	35	—	7,278	
Con. For. Prod.	—	—	—	—	—	—	—	—	
Salvage	—	—	—	1	—	—	—	1	
TOTAL	741	440	5,882	181	—	35	—	7,279	915
Western Lassen									
Allocated	102	—	2,154	596	—	3	—	2,855	
Con. For. Prod.	—	—	—	—	—	—	—	—	
Salvage	35	—	10	27	—	—	—	72	
TOTAL	137	—	2,164	623	—	3	—	2,927	400
TOTAL ALL WORKING CIRCLES									
Allocated	57,446	482	39,328	1,964	—	813	—	100,033	
Unallocated	2,492	—	392	—	—	56	—	2,940	
Con. For. Prod.	—	—	—	—	1	8	—	9	
Salvage	996	—	72	45	—	—	—	1,083	
TOTAL	60,904	482	39,792	2,009	1	877	—	104,065	18,520

RO-122-R5
 (2/1/52)

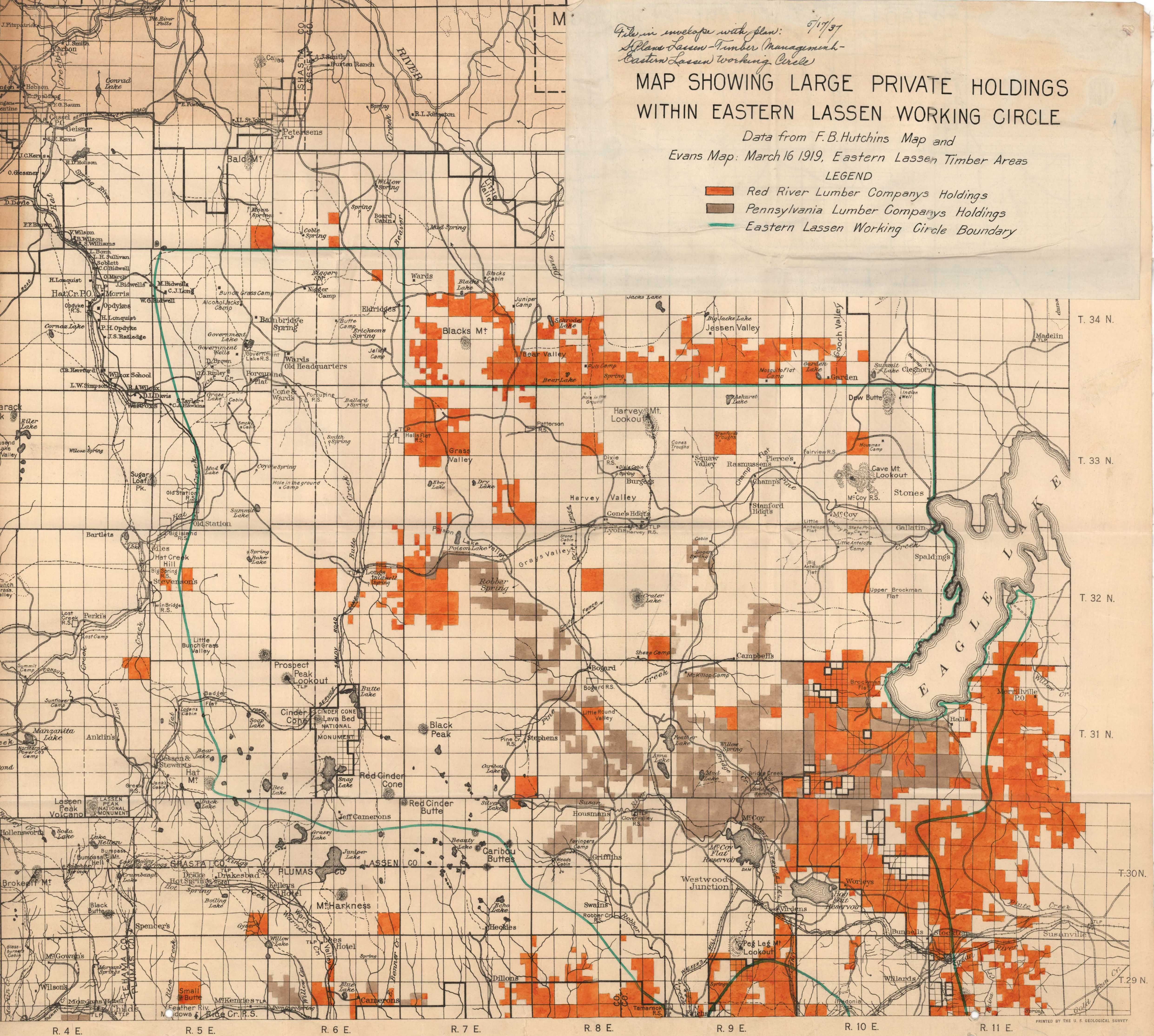
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H. Plank Lassen-Timber Management-
Eastern Lassen Working Circle

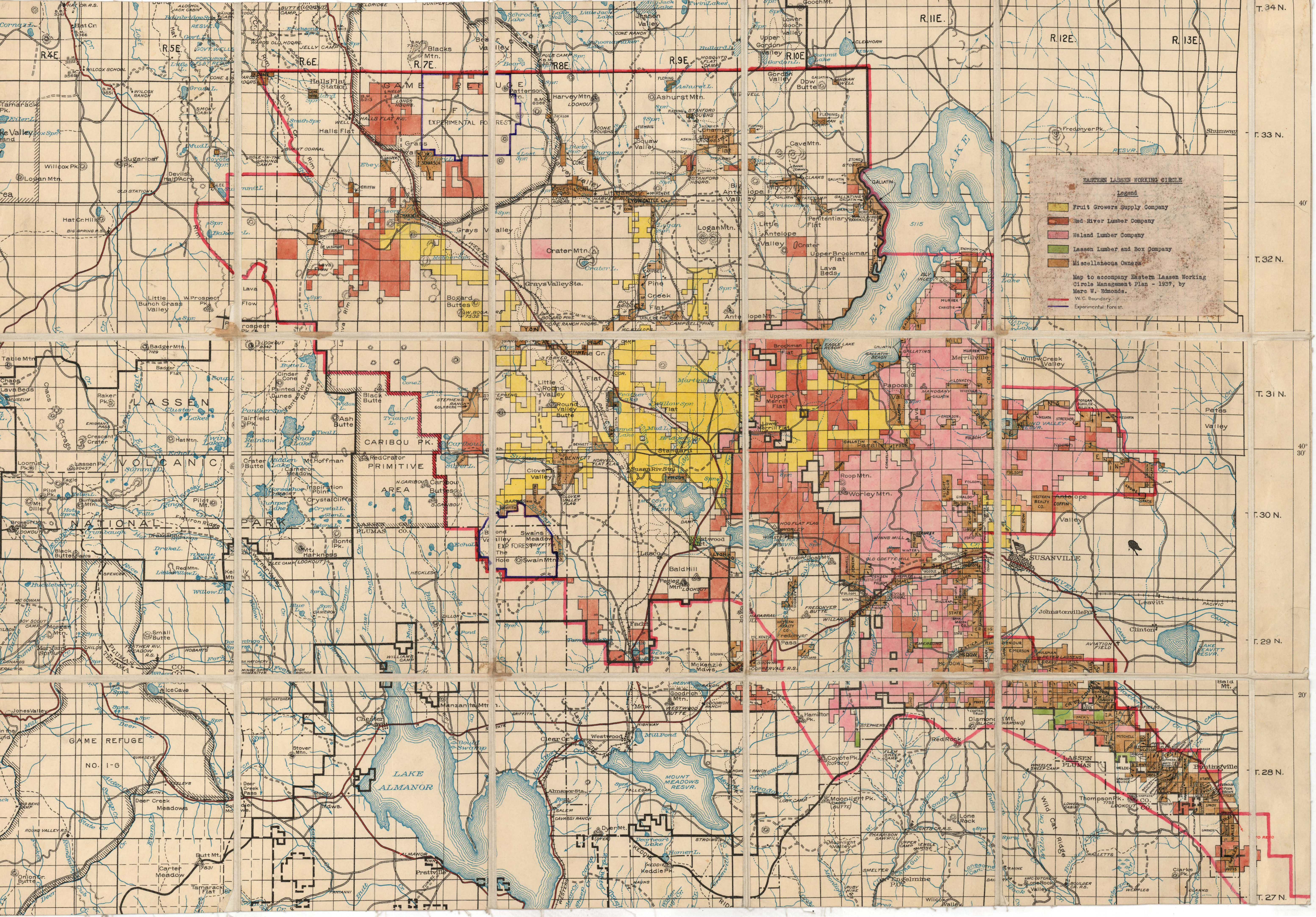
MAP SHOWING LARGE PRIVATE HOLDINGS WITHIN EASTERN LASSEN WORKING CIRCLE

Data from F.B. Hutchins Map and
Evans Map: March 16 1919, Eastern Lassen Timber Areas

LEGEND

- Red River Lumber Company's Holdings
- Pennsylvania Lumber Company's Holdings
- Eastern Lassen Working Circle Boundary





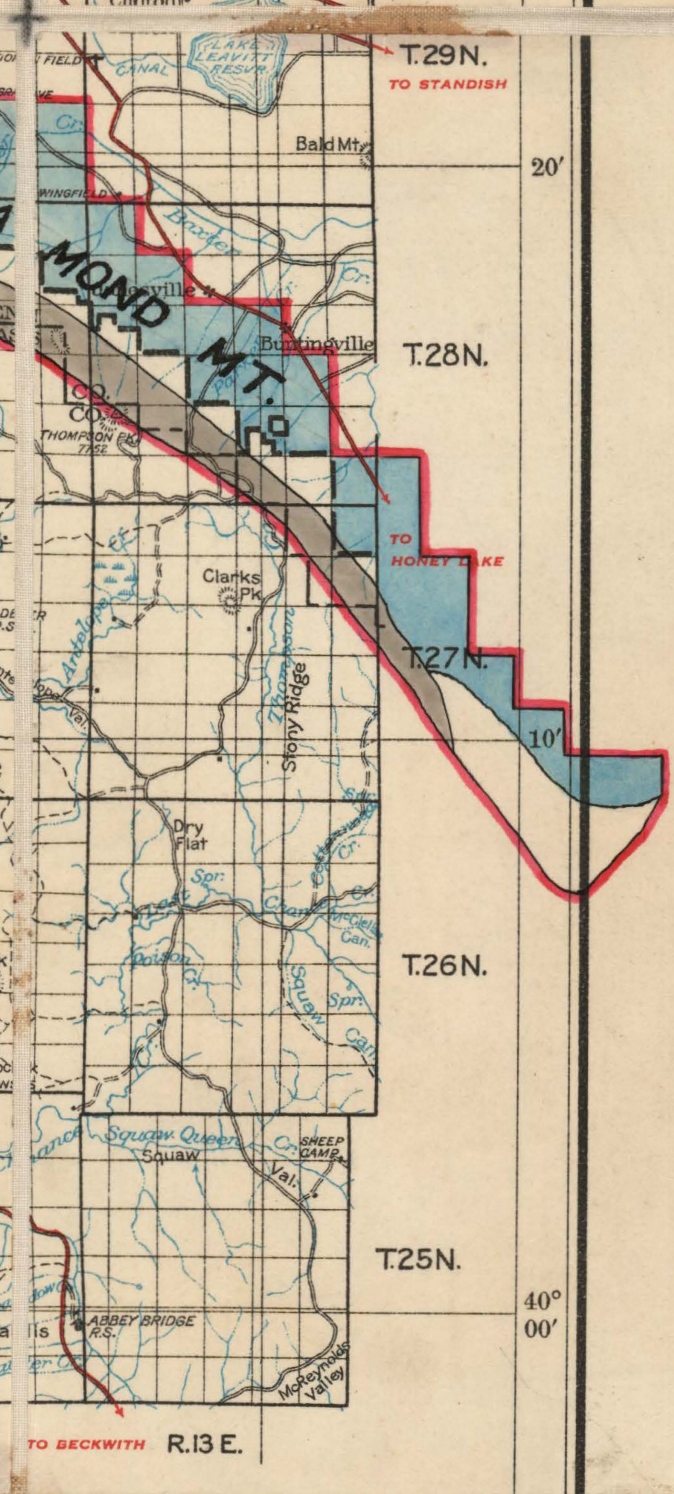
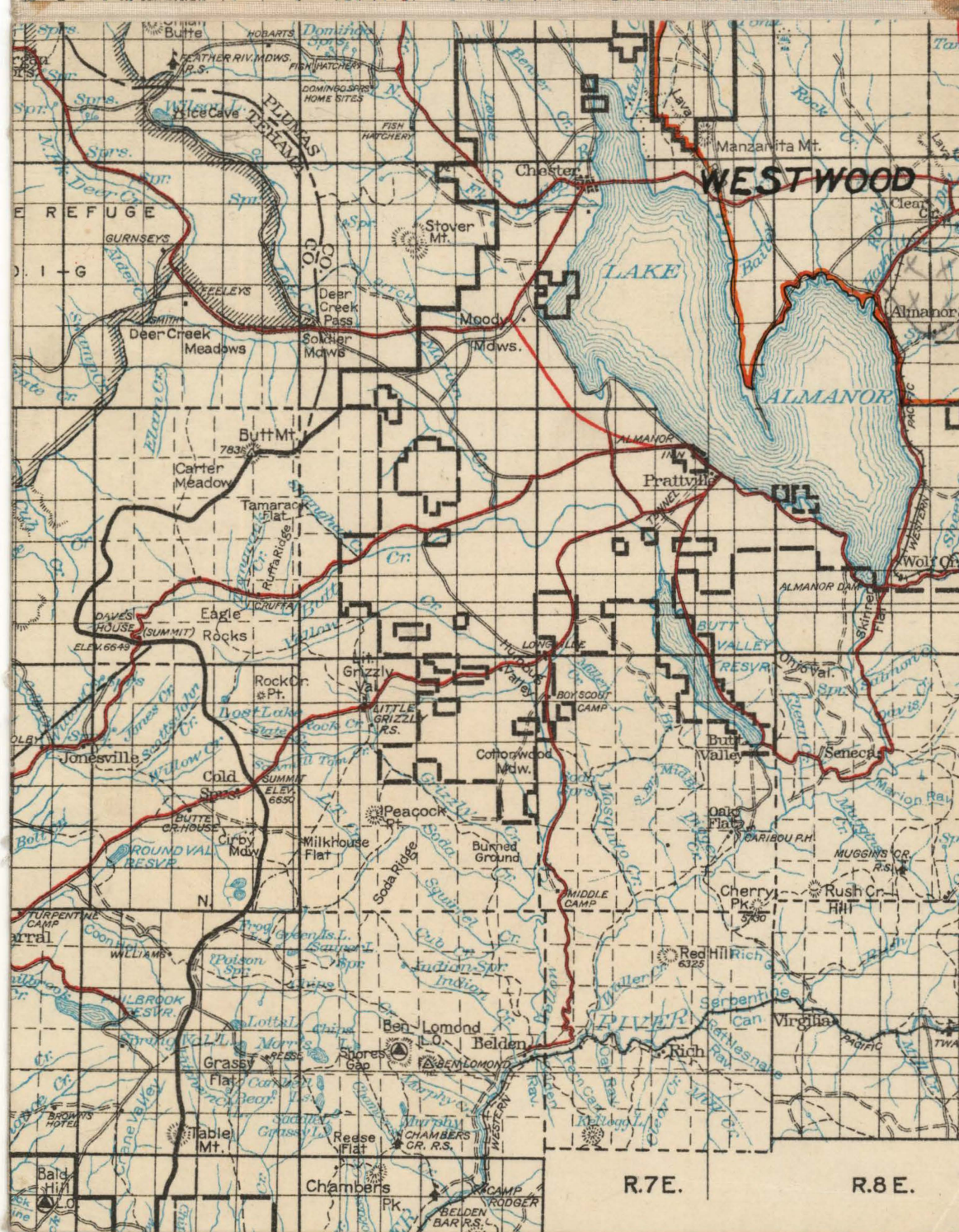
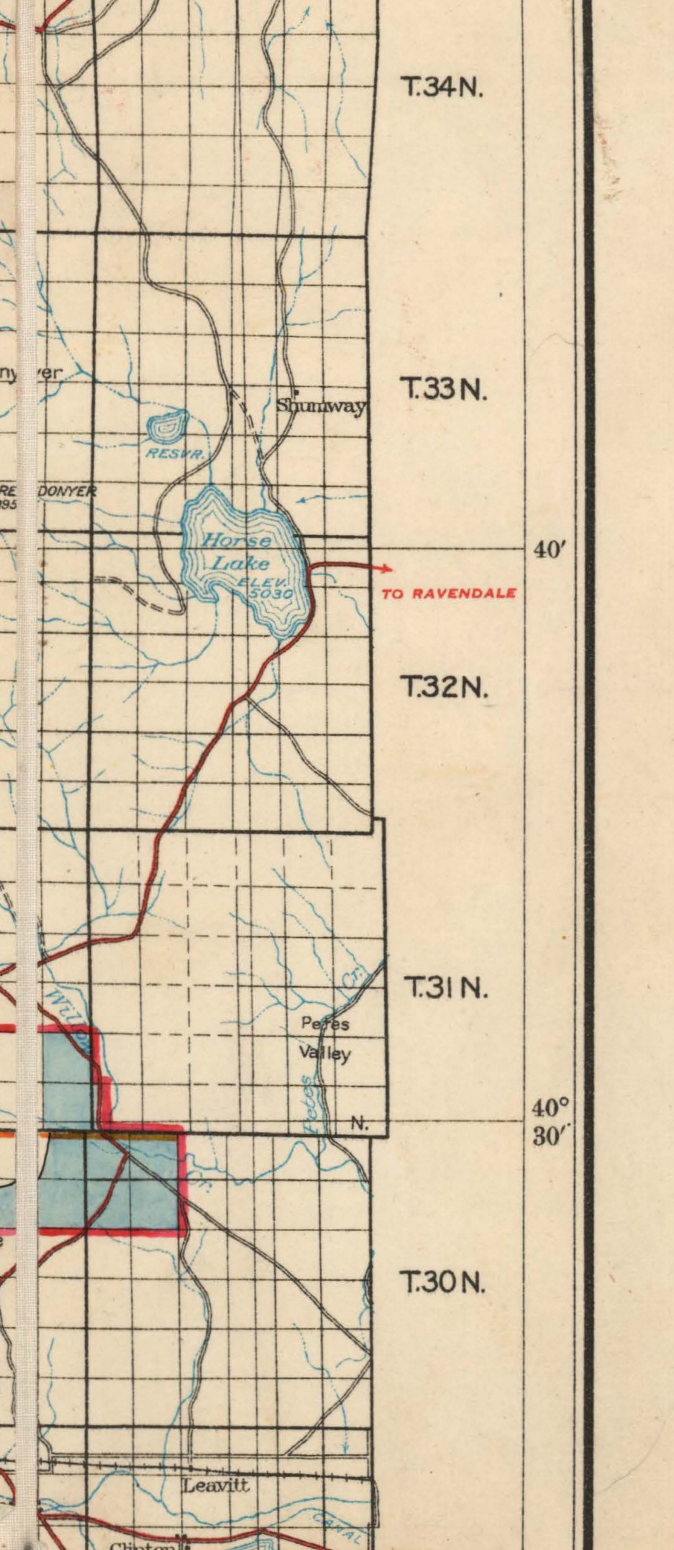
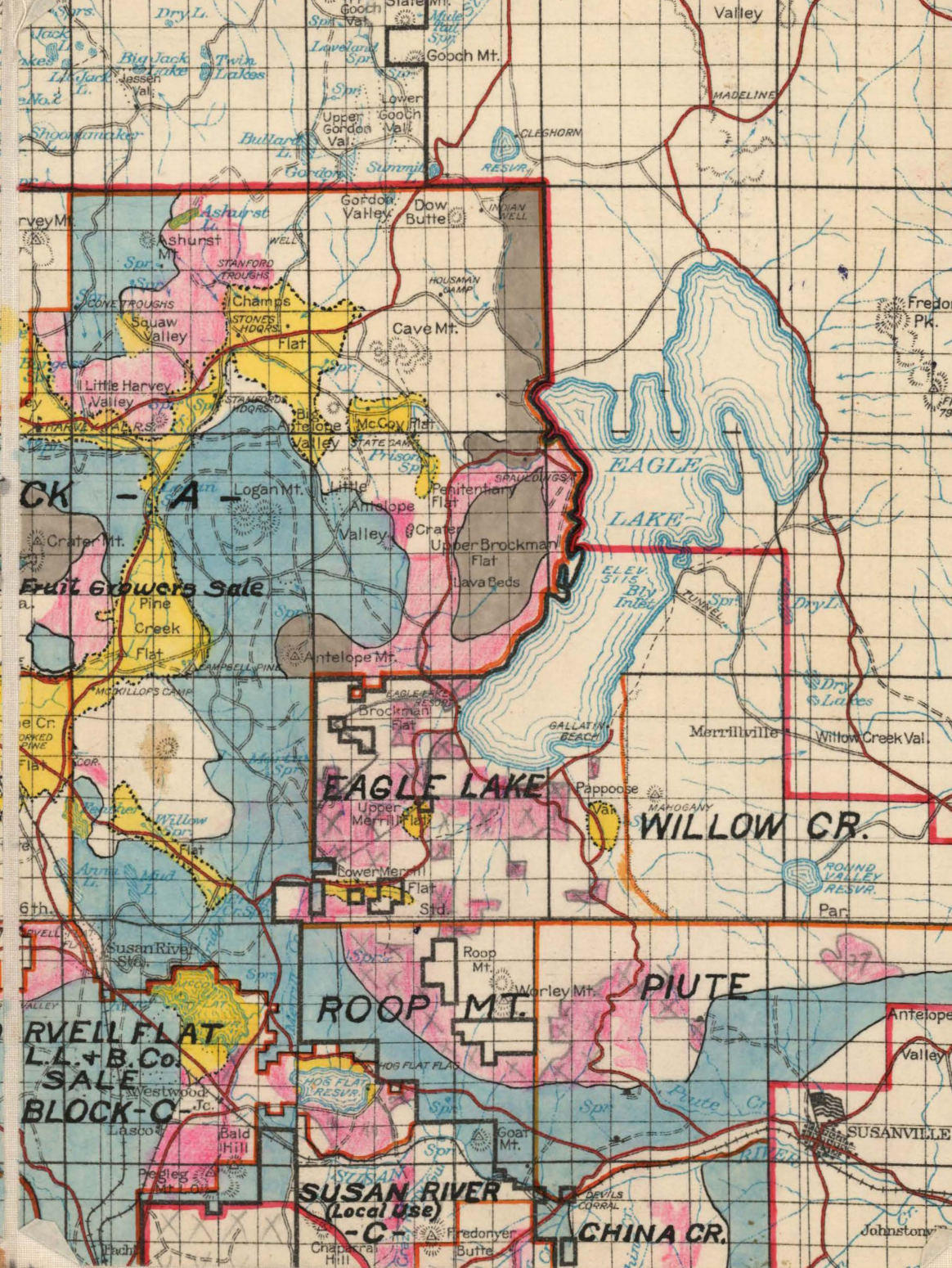
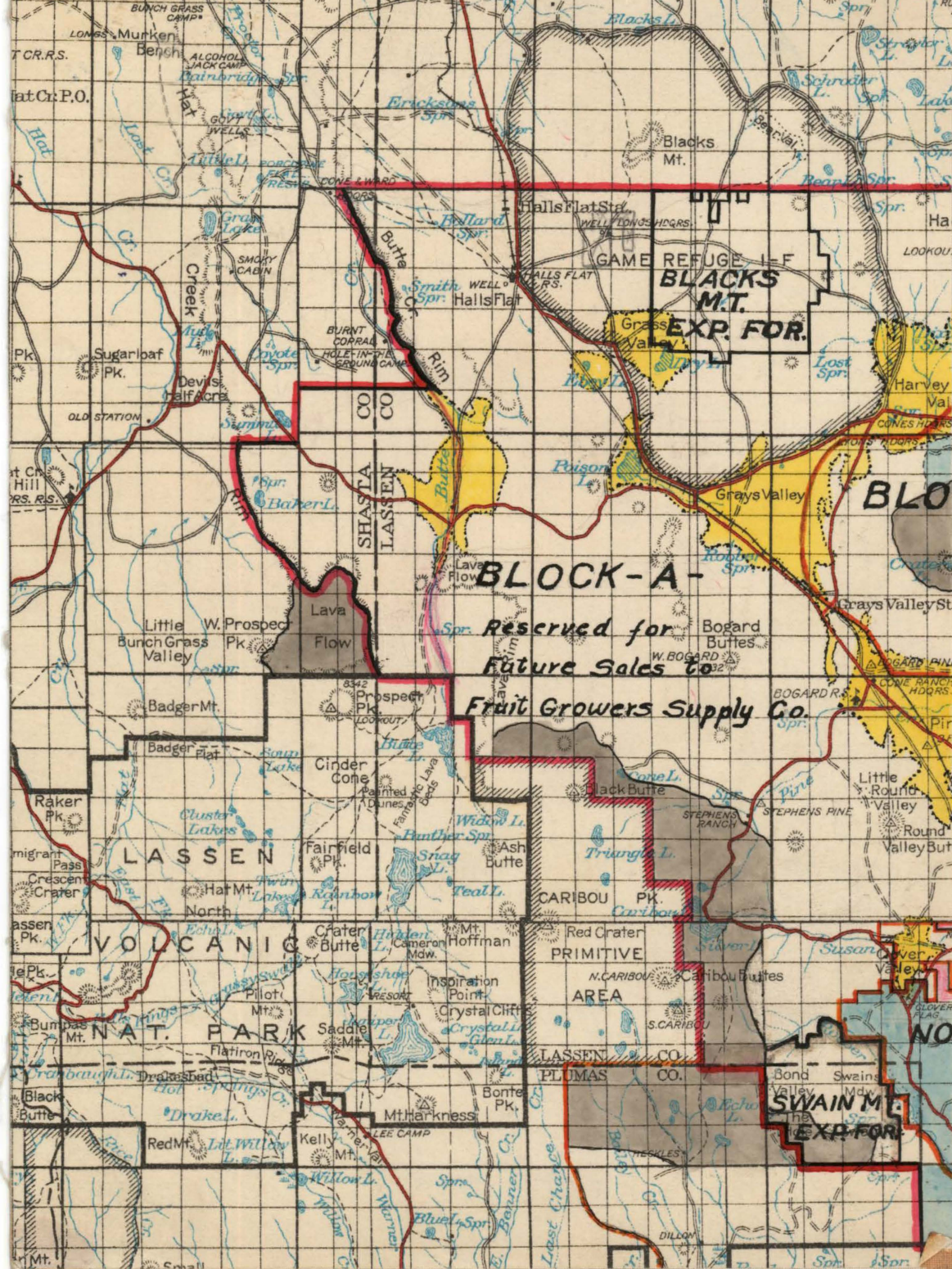


DIAGRAM OF UNITS

EASTERN LASSEN WORKING CIRCLE

LEGEND

- Working Circle Boundary
- Sale or Logging Chance Boundary ...
- Grazing Land
- Unmerchantable Timber
- Cutover land..... 12/1/35

Map to accompany Management Plan for the Eastern Lassen Working Circle, 1937, by Marc W. Edmonds.